Montana Outdoors

March/April 1984
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Montana Outdoors

March/April 1984, Vol. 15, No. 2
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Front Cover

The grizzly bear, such as the fine example photographed by Louis M. Kis, is a game animal in Montana. The limited season on the bear brings to its cause many who might not otherwise be there. Hunters who mistake the grizzly for a black bear threaten the future of this hunt, as well as spring black bear seasons.

Back Cover

The theme for the 46th annual National Wildlife Week is: "Water—We Can't Live Without It." Mountain lions can't, nor can most other living things. The week will be observed March 18-24, under sponsorship of the National Wildlife Federation, and with additional activities planned by the Montana Wildlife Federation.

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BIG SKY HOEDOWN

As the days of early spring grow longer and the sun's rays become steadily warmer, life on the Montana prairie slowly awakens. As if to celebrate the arrival of another season of growth and renewal, Montana's prairie grouse—the sharp-tailed and sage grouse—begin their ancient courtship rites. For several weeks each spring, these normally shy and inconspicuous prairie dwellers throw caution to the wind and gather at timeworn dancing grounds to engage in noisy and colorful mating displays. Preoccupied with their hoedown under the Big Sky, they seem to hear only the prairie wind and the irresistible call of all living things to reproduce their own kind.

Sharp-tailed grouse begin to arrive at their communal dancing grounds or "leks" in late March or early April. Both males and females are in attendance, but the males, with their ritualistic posturing and strange vocalizations, are clearly the center of attraction.

At times, two males will lunge toward each other, or dash parallel to one another along an invisible territorial boundary. When confrontations grow especially heated, they may leap into the air and flail one another with claws, beaks, and wings. Sometimes a bird will jump into the air with a loud wing flutter, fly forward a few feet, then land again. Occasionally a male will face a female and lower his head to the ground in a courtly "nuptial" bow.

But perhaps the most fascinating routine in the male sharptail's amorous repertoire is its "dancing" display. With its neck feathers erected to expose two pale-violet patches of skin, the grouse spreads its wings, raises its tail, lowers its head, and moves forward very quickly with a series of staccato steps. Adjacent males start and stop this frenzied dance in perfect synchrony; one moment the dancing ground is buzzing with activity; the next moment all the birds have stopped simultaneously and an eerie hush falls over the lek. Then, as suddenly as it stopped, the action starts again.

by Dave Books

photos: NEAL MISHLER

When the lordly male sage grouse—dubbed "Cock of the Plains" by Lewis and Clark—draws himself to his full height and puffs out his chest, the rest of the prairie sits up and takes notice. Weighing as much as seven pounds, he puts on a mating display worthy of a bird of his imperial mien.

Male sage grouse usually appear on the dancing grounds in March, although courtship activity does not peak until mid-April. Like sharp-tailed grouse, sage grouse defend their territories vigorously, striking each other with their wings until the vanquished bird withdraws.

Arriving on the dancing ground before dawn, the male begins to perform his dance with the onset of morning light. With hairlike black plumes erected over his head, he cocks his tail and spreads his spiky tail feathers in a fan and begins to inflate the pendulous air sacs on this neck. As he inhales more air with a gulping motion, the neck feathers part, exposing two olive-green skin patches framed by a ruff of bristly white feathers resembling an ermine cape. Thrusting his wings forward so that the tips droop on the ground, he takes several quick steps forward, then stops abruptly, scraping his wingtips across the feathers of his white cape to produce a swishing sound.

He repeats this performance until his neck sacs, bobbing like two rubber balls on his chest, are fully inflated. Then, with a sudden contraction of his neck muscles, he produces a loud "plop"—as one observer put it, not unlike "the noise made by a rock dropping into an old well." ■

photos: DAVE BOOKS

MONTANA'S MILLION-DOLLAR BLACK BEARS

by Mike Aderhold

"He bade me have a care for the future, to make sure of the bear before I sell his skin."
—Aesop

It is time to take a closer, more detailed, look at Montana's black bears.

Over the last 20 years, almost without notice, the black bear has become a valued game animal. In terms of days of hunting recreation, it now ranks fourth, behind elk, mule deer, and white-tailed deer. The Montana black bear harvest is fourth in the nation, behind Washington, Oregon, and Idaho, and slightly ahead of Alaska and Maine. In black bear habitat and production, Montana perseveres as one of the top six states in the country.

In 1983 in Montana, 731 non-residents and 5,276 residents paid over $115,000 for separate black bear licenses. In addition, 18,988 resident sportsman licenses were sold with bear tags, representing another $151,904. Last year, the black bear generated over a quarter of a million dollars in license revenue—and this does not include the black bear tag in the 17,000 non-resident combination licenses.

The 1982 hunter harvest telephone survey indicated that 11,062 people spent 62,088 days hunting the black bear, and they harvested 1,275 animals. In 1981, black bears provided 89,472 days of hunter recreation—more than antelope, bighorn sheep, moose, mountain goat, grizzly bear, and mountain lion *combined.*

Figuring the average cost of a day of bear hunting at $36 for lodging, food, gas, shells, camping gear, clothing, etc. (from the U.S. Fish and Wildlife Service's 1980 "National Survey of Fishing, Hunting, and Wildlife-Associated Recreation"), the black bear in Montana is now worth—every year—at least $2.2 million. This money turns over at least four times in rural Montana.

This information is haunted by the fact that in recent years while hunter effort has increased, success has decreased (see table).

Black bears are creatures of the forest and its edges and clearings. They lack the highly specialized digestive systems of ruminants such as deer and elk, and depend on readily digestible food. Bears are opportunistic omnivores, eating meat when it is available and high-quality vegetation when it is not. They eat a variety of grasses, sedges, and wildflowers when these plants are in the high-

MIKE LOGAN

protein states of preflowering or flowering. Their diet is flexible—they also eat a variety of roots, bulbs, corms, tubers, nuts, seeds, berries, and animal tissue.

Because they require relatively scarce, high-quality food, their populations are of low density when one compares them with deer and elk. When these high-quality foods are no longer available in the fall, black bears hibernate.

In a mature forest, except for nut- and fruit-producing trees, the most productive areas for black bears are open stands, edges, and moist areas. The bears prefer to feed at regenerating burned areas, wet meadows, open stream banks, and roadsides. Annual production of its required foods seems to control the bear's size, size of its home range, its reproductive success, and total numbers of animals in the population.

Over the last several hundred years, Montana's forests have probably supported sizable black bear populations. The number of black bears has undoubtedly increased this century because of the openings created by fires, logging and road construction, and the new foods introduced by human settlement.

The earliest attempts to estimate black bear populations in Montana were made by the U.S. Forest Service in the second decade of the 1900s. Sixty-two years of continuous estimates in the Kootenai National Forest in northwestern Montana show a sevenfold increase between 1920 and 1982—from about 370 to 2,600 bears. The population estimate peaked in the mid-1970s at close to 3,400 bears.

Like all forest wildlife, black bears are impossible to survey accurately. These figures are merely rough estimates based on casual observations, but the trend over time is probably close. The main factors that reduce a black bear population are human predation, the impact of access on the security of the animal, extensive habitat alteration, human intolerance, and climatic conditions that limit the quality and quantity of traditional bear foods.

In Montana, black bears range over almost one-third of the state. They are found in a variety of forest habitats, varying from relatively dry, open ponderosa pine stands to dense spruce-fir forests. In general, the wetter the forest, the more black bears it supports and produces. The most productive black bear habitat in Montana is found in the northwestern corner. Bear numbers decrease as one moves south and east (see table).

Scientists believe there are less than half a million black bears in North America, with less than 200,000 in the continental United States. At one time, free-roaming black bears were found in every state except Hawaii. Today, they survive in about 40 states, but are common only in 25.

Black bears are probably the only common big game animal in the United States whose populations have decreased significantly in the last 20 years. Arkansas— once known as the "Bear State"—has fewer than 75. Ohio, Indiana, and Illinois have fewer than 50 each. Alabama, Georgia, Mississippi, Nevada, New Jersey, Oklahoma, South Dakota, and Texas all have had closed seasons for at least 10 years. In Florida, the black bear has been declared a threatened species; in the late 1970s, it was estimated that there were fewer than 3,000 in all of the 11 southeastern states. Land clearing, the spread of civilization, and poaching are blamed for most of this decline.

The northwestern part of the United States now has the richest black bear resource. Washington has the highest population estimate, between 27,000 and 30,000, and Oregon is next with 20,000 to 25,000. Idaho and Montana are next, each with populations over 9,000. Black bears range over three-fourths of Alaska, but because of the huge area and limited access, no population estimate is available. Maine, Michigan, New York, Colorado, Wisconsin, Minnesota, New Hampshire, New Mexico, Wyoming, Arizona, North Carolina, Pennsylvania, Vermont, Virginia, and northern California still have good black bear populations, but the populations are no longer contiguous as they once were. In some places, they are decreasing at surprising rates.

Bears, both black and grizzly, have the lowest reproductive rate of any big game animal in North America. In the only long-term (1959-66) black bear study in Montana, Dr. Charles Jonkel, now of the University of Montana, found that bears in the spruce-fir forest immediately west of Glacier National Park did not sexually mature until they were 4½ years old. He did not observe a female younger than 6½ with cubs. The litter size averaged less than two cubs (1.6), and some bears went two or three years between litters. Because of this low reproductive rate, it is difficult to bring back a low black or grizzly bear population.

Over the last 25 years, the status of the black bear has changed from that

of a pest to that of a valued game animal. Before 1955, at least 12 states with promising bear populations classified the animal as a furbearer or a predator, or offered a bounty. Since 1961, nine states have formally established the animal as a game species.

Even though the black bear has been classified as a game animal since the first part of the century, Montana did not have a black bear license until 1961, when a limited $20 non-resident black bear season license was issued. In 1965, a $20 unlimited *spring* black bear license was established, and it was raised to $35 in 1968. In 1971, the $35 non-resident black bear license was made good for the entire black bear season, and the spring bear hunting license was discontinued. In 1976, because of inflation, the non-resident bear license was raised to $50, and in 1980, it was increased to $100, the current license fee.

Residents could hunt the black bear on a deer or elk license until 1971 when a $5 black bear season license was established. This license was increased to $6 in 1976, and raised to the current $8 in 1981.

In most of Montana, a continuous spring-summer-fall black bear hunting season (from April 1 to the last Sunday in November) has prevailed since 1959. The northwestern part of Montana went to a split spring and fall season in 1977 because of hunting pressure. This winter, wildlife managers proposed no fewer than seven different black bear seasons for various parts of Montana. Six of the seasons are more conservative than last year's and reflect concerns that harvest may be ahead of the bear population's ability to withstand the hunting pressure. The 1984-85 black bear season will be resolved by the Fish and Game Commission the second week in March, and assuredly will be more restrictive than at any time in the past.

Most black bears in Montana are harvested in late May or early June, during a brief time when the bears are out and the shrubs are just starting to leaf, and in September, when the bears are in high, open areas feeding on the ripening berries and seeds. Last year, about 40% of the black bear harvest was in spring, and almost two-thirds of the bears were killed west of the Continental Divide (45% in northwestern Montana).

Over the last 25 years, the status of the black bear has changed from that of a pest to that of a valued game animal.

Nationally, bear hunting methods include individual still hunting, driving or party hunting, hunting with dogs, bait hunting, and taking bears incidental to hunting other game. In Montana, hunting with dogs and bait hunting are illegal, except for livestock owners, department personnel, and U.S. Fish and Wildlife Service officials taking bears that are killing stock. (If a bear is killed, a warden must be notified.) While biologically acceptable, bear hunting with dogs requires strong public support and tight control. Use of dogs during the general deer and elk season creates confusion and bad feelings between hunter groups. Use of dogs in spring, when game animals are born, does not usually appeal to the public. Large dog packs can be hard to control, and loss of control results in harassment of other wildlife (including grizzly bears) and lost dogs. But hunting with dogs is effective, can be physically challenging, and is an option for damage control.

Hunting over bait (meat, fish, honey, or scent) is *too* effective in good bear country, and can condition animals to food that could later cause man/bear conflicts. The advantage of bait hunting is that it cuts wounding loss and allows the hunter to be more selective for older males.

Party hunting is popular in the Midwest and involves a group of people sweeping a limited area and driving the bears into other hunters. This technique works best in areas with isolated swamps and small woodlots. It is not as effective in large western forests.

The most popular form of bear hunting in Montana involves driving a forest road to a vantage point and glassing adjacent hillsides or recently logged areas. Once a bear is located, the hunter stalks it. A few use the classical still-hunting technique: locating an active feeding site and then patiently watching the area for a bear's appearance. This can be a rewarding technique, but to be successful, one has to become intimately familiar with a piece of country, the bear's feeding habits, its travel patterns, its sign, and its preferred feeding areas. If the object is pure

SPRING AND FALL BLACK BEAR INFORMATION—1971-74

Region	Estimated Distribution Area	Black Bears Occur On	Hunters Afield 1971-74 (avg.)	Hunters Afield 1982	Estimated Harvest 1971-74 (avg.)	Estimated Harvest 1982	Recreation Days 1971-74 (avg.)	Recreation Days 1982	19
1	10,180 sq. mi.	91%	2,400	3,856	700	473	19,300	22,911	
2	7,000 sq. mi.	68%	1,200	3,106	300	322	8,900	18,405	
3	9,600 sq. mi.	53%	845	2,073	140	282	5,600	11,500	
4	6,650 sq. mi.	28%	510	1,393	72	127	3,100	6,512	
5	600 sq. mi.	4%	252	634	29	71	1,400	2,760	
State Totals	**34,030 sq. mi.**	**26%**	**5,207**	**11,062**	**1,241**	**1,275**	**38,300**	**62,088**	

sport hunting, this can be the ultimate experience.

Quite a few of the black bears harvested in Montana are taken in conjunction with hunting some other game such as deer or moose. This type of hunting is incidental or accidental, because the bear is seldom the main animal hunted.

Use of lights, radio communication with an aircraft, or shooting from a motor vehicle are hardly "fair chase"—as well as being illegal. Such practices degrade the image of the hunt, have little to do with sport recreation, and create adverse public opinion.

The fact that hunters are not required to salvage bear meat in Montana is a legacy from the days when the animal was considered a predator or a furbearer. Properly rendered, the fat from a black bear is one of the best pastry shortenings available. The meat is rich, with fine texture and flavor. In pioneer days on the East Coast, there was a limited industry in capturing black bears and fattening them for the table. Bear meat, like pork, can carry trichinosis, so always cook the meat thoroughly.

Not everyone sees the black bear as a trophy animal. Many give it a negative value as a predator, nuisance, and destroyer of crops and property. Black bears can create problems. Last summer, the department responded to over 130 black bear-related complaints statewide. A survey in the mid-1970s showed that 45% of the complaints involving black bears were related to garbage, 14% to beehives, 10% to orchards, 7% to confirmed killings of livestock, 5% to eating livestock, and 19% to other

Black bear management has suffered because of a lack of information. This will soon change. The department's black bear efforts will be intensified to reflect the animal's current status in Montana.

considerations including orphaned and wounded animals; appearances within city limits among people; entering trailers, cabins, gardens, chicken coops, etc., and causing traffic accidents. The percentages are roughly the same today.

About half or more of the complaints result in the setting of a culvert trap or snare and relocating the offending animal. Usually a dozen or so black bears are dispatched each year because of the nature of their offense or the condition of the animal. The U.S. Fish and Wildlife Service Animal Damage Control Division assists with damage and control actions east of the Continental Divide.

The presence of garbage and other refuse is the most common cause of unwanted interaction between bears and people. When human foods are readily available in bear country, bears will be attracted. The bear's behavior is changed and its natural pattern of food selection is altered. The result is often property damage, increased chance of human injury, and frequent removal or destruction of the bears involved. It is a waste of the sportsman's dollar, and of a valuable resource.

The solution to problems with beehives seems to be platforms 10 feet high with an overhang deck of about four feet, or electric or reinforced fences. Also, hives placed 300 yards or more from forest cover are much less likely to be damaged by black bears.

Although it occurs infrequently, bears will probably always prey on sheep at lambing time, particularly when the flock is small and unattended. Considering Montana's bear population, documented losses are surprisingly low. Where control is necessary, it should be recorded and the offending bear humanely dispatched or removed. Special hunts before periods of expected depredation may reduce livestock losses.

Because of the black bear's growing status as a valuable wildlife resource, in February 1977, the Boone and Crockett Club and the Campfire Club of America sponsored a three-day symposium in Kalispell on "Management Biology of the North American Black Bear." Thirty-six states were represented, and over 100 biologists participated. From the meeting emerged a book ("The Black Bear in Modern North America," published in 1979), edited by Stevensville writer Dale Burk—and a loose, informal network of contacts for trading bear management information.

In 1979, the First Annual Black Bear Workshop was conducted in Tempe, Ariz. This workshop summarized the status and management of black bears in the public land states and western Canada.

Last year, Montana also sent a representative to the Sixth International Conference on Bear Research and Management sponsored by the Bear Biology Association, a worldwide organization of over 250 researchers and managers working with bears. Partly from this meeting came the idea to establish a Montana Bear Committee with one representative from each of the five department administrative regions supporting bears. The group was charged with assembling black bear information and recommending to wildlife managers when adjustments are needed. This group met for the first time Dec. 12, 1983. Also attending were biologists who had done some black bear work in association with their grizzly research.

Black bear management today is about where deer and elk management was 30 years ago. Most of what is known about the bears has come from cooperative Forest Service/Fish, Wildlife and Parks summer surveys, which are based on casual observations of a few interested employees, and from harvest information obtained from the department's annual telephone

1982

Success 74 (avg.)	1982	Days Hunted Per Bear 1971-74 (avg.)	1982
29%	12%	28	48
25%	10%	30	57
17%	14%	40	41
14%	9%	43	51
12%	11%	48	39
19% avg.)	11% (avg.)	38 (avg.)	47 (avg.)

survey. It is not much—but this information provides a foggy picture of hunting pressure and success, relative distribution, and some long-term information on litter size. What it does *not* provide and what is needed for future management is sound information on: population size and annual trend, population density as it relates to the ability of an area to sustain bears, cub and yearling survival, magnitude of the depredation problem, success of relocation efforts, and a little better handle on what bear hunters want and expect.

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Even for experts, it's sometimes hard to tell a black bear from a grizzly bear (see the identification guide on page 36). Even though most black bears are completely black, their color ranges from black to brown to cinnamon. If you're hunting and you're in doubt, let the animal pass; mistaken kills can threaten both grizzly and black bear seasons. Although not a typical example, the bear above is a black bear.

The 1959-66 study on 80 square miles in the North Fork of the Flathead River drainage remains the only comprehensive black bear work done in Montana to date. Last year, some useful black bear information was gathered incidental to two grizzly bear research projects: one funded by U.S. Borax in the Cabinet Mountains near Libby, and another along the East Front, west of Choteau. Additional information on black bears will probably also be gathered from these projects this year. In addition, the Montana chapter of Safari Club International recently contributed $10,000 for some needed black bear research in Region 5 (Billings).

These efforts are helping—but they are not enough. A 1983 helicopter survey in the Cabinet Mountains southwest of Libby illustrates the problem. In an area of about 200,000 acres—most of which has been closed to spring bear hunting since 1980 because of a perceived decline in black bears—researcher Jerry Brown, in nine flights totaling 25 hours of flying time over seven days, counted 250 bears. Just considering the bears he *saw,* that's one bear per 800 acres. This is possibly the richest black bear habitat between the west side of the state of Washington and northern Maine.

There is a trend in wildlife administration to tie the degree of management of a species to the public's interest in that species. Because of its sometimes troublesome nature, the black bear has had a low priority. Less than $20,000 per year is spent on the animal, and most of that is for damage control. Only in Region 3 (Bozeman) is limited black bear work totally supported by Fish, Wildlife and Parks revenue. In Regions 1 (Kalispell) and 4 (Great Falls), black bear study is related to grizzly bear projects funded by mining, oil, or gas companies. Region 2 (Missoula) presently has no black bear studies, and the work in Region 5 (Billings) is financed through the Safari Club contribution.

Black bear management has suffered because of a lack of information. This will soon change. The department's black bear efforts will be intensified to reflect the animal's current status in Montana. Some ideas under consideration include:

1. Removing the black bear license from the existing combination license so that interest in the bear can be more accurately measured and bear hunters better surveyed.

2. Requiring a mandatory tooth check. With reliable information on sex and age, better assessments of productivity, survival, and current population are possible.

3. Developing specific regulations and hunting maps for bears—black and grizzly—that will more accurately depict distribution, special needs of each species, and provide information about each species.

4. Increasing public awareness of

continued on page 36

The Catchall

Boone and Crockett Update by Norman C. Roettger, Jr.

• There are all kinds of hunters, and many different yardsticks of hunter and management success. The number of trophy animals a state produces is only one such measure. As the following article illustrates, Montana is doing well in achieving listings in Boone and Crockett. But as our state's deer, elk, and antelope numbers alone underscore, we are also producing quantity—which to many hunters is synonymous with quality.—Ed.

* * * * *

Hunters continue to take Boone and Crockett trophies at a record pace, especially in Montana. In the March/April 1981 issue of *Montana Outdoors* ("Some Nuggets Panned from Boone and Crockett"), we explored the record number of super-trophy antlers and horns taken in the six years before publication of the 1977 edition of Boone and Crockett's "North American Big Game." The latest edition contains cumulative records, including new ones established from 1976-79.

A quick look at the new records reveals that harvest of trophy big game is continuing throughout North America, including super-trophy heads (those in the top 20 of a species). But there are even more interesting developments in connection with harvest of some of Montana's favorite big game.

THE BIG ONES STILL ARE OUT THERE

The continuing statistics ought to convince even the skeptics that the big ones not only still abound, but are increasingly available to dedicated sportsmen. The following chart lists the numbers of the top 20 animals of various popular species taken from 1976-79:

Canada moose	7
Black bear	6
Quebec-Labrador caribou	6
Rocky Mountain goat	4
Barren ground caribou	4
Alaska-Yukon moose	4
Shiras moose	3
Pronghorn antelope	3
Grizzly bear	3
Elk	2
Mountain caribou	2
Cougar	2
Stone's sheep	1
Coues' deer	1
Mule deer	1
Woodland caribou	1

There were no additions to the top 20 from the remaining six species tabulated (brown bear; Dall's, bighorn, and desert sheep, and whitetail and blacktail deer).

The only two species that showed a reduction from the first six years to the last four years of the '70s were the typical whitetail and Columbia blacktail deer. Seven super-trophies of each were taken in the first six years of the 1970s, but none were taken in the last four years.

If you've ever been fortunate enough to see a trophy head in the top 20 of any species in Boone and Crockett—or, better still, have taken one yourself—then you know what a splendid skull or set of horns or antlers looks like. Among the super-trophies taken in the last four years are some right at the top of the rankings. For example: the #2 pronghorn antelope (taken in Montana's Garfield County in 1977), the #1 and #2 black bear, the #4 Coues' deer, the #1

FRED J. BOYER

Alaska-Yukon moose (eclipsing the previous #1 which had been taken in 1961), the #2, #3, and #4 Canada moose, the #7 Shiras moose (taken in Idaho), the #3 mountain caribou, the #2 barren ground caribou, the #3 cougar, and—perhaps most significant—the #3 elk (both the #1 and #2 elk were taken in the 1890s). In addition, the #14 elk was taken in Park County, Montana. The understandably popular elk—whether on the wall or on the table—has taken awhile to recover from the lack of wildlife management at the turn of the century, but it seems to be well on its way back, at least in terms of quality. For example, six of the top 14 elk in Boone and Crockett were taken in the 1970s.

However, the Boone and Crockett tables are not the last word in game trophies because, for various reasons, they are incomplete. For example, the very fine bighorn ram taken by Armand Johnson near Thompson Falls, Mont., in 1979 (see *Montana Outdoors*, Jan./Feb. 1980) is not listed in the 1981 edition of Boone and Crockett. However, for the period 1980-82, Johnson's ram was the largest in its class, and he received a "first award" at a July 1983 Boone and Crockett banquet. Even though it may take a long time to appear in print, Boone and Crockett nevertheless gives us a good indication of what's happening in the harvest of trophy animals.

Looking ahead, the next edition should list further super-trophies: We know from other hunting periodicals that a new #1 non-typical whitetail (non-typical heads are not included in this or the previous article) was taken in 1981. Surprisingly, it was taken in St. Louis County, Missouri. It eclipsed the previous #1 (set in 1892) by more than 40 points. Also, a splendid Shiras moose with a 54-inch rack was taken during the 1982 season in Buffalo Fork in Montana's Absaroka-Beartooth Wilderness.

MONTANA'S BIG GAME ABUNDANCE

Let's take a look at three of Montana's more popular big game animals—the elk, antelope, and bighorn—to see how well Montana is faring in highly prized game animals like these.

Elk

More elk are harvested in some other states than in Montana, but no state comes close to Montana in the number of *trophy* elk harvested. In the recent Boone and Crockett book, 10 new elk listings were added to the cumulative top 100. Of those 10, four were taken in Montana. The province of Alberta had two, and the other four were scattered among Idaho, New Mexico, Wyoming, and Arizona. Incidentally, the elk taken in Idaho and Wyoming were both taken in counties bordering Montana.

Let's move the scope to the top 100 in the cumulative records and see how Montana stacks up. Montana does *ex-*

tremely well. You can't beat first! Montana leads all states and provinces with 20 of the top 100 elk. The next closest is Alberta with 17; Idaho falls in with 16, Wyoming with 15, Colorado with 10, Arizona with six, Oregon with five, New Mexico with four, Saskatchewan with three, and one each for Washington and Manitoba, with two listed as unknown.

Simply put, Montana has 20—or 20%—of the elk in the top 100. The best thing of all is the geographical distribution of Montana's 20 elk in the cumulative top 100 of Boone and Crockett: 13 counties are represented; only three counties have more than one elk in the top 100. Three locations aren't readily identifiable as to county. For trophy elk hunters, not only is it clear that Montana is #1, but also that the riches are spread all over the Treasure State.

Looking *only* at the top 100 elk taken throughout North America in the 1970s, 15 were taken in the first six years of the decade, and 10 in the last four years (for a total of 25 elk). Again, Montana leads all the rest of the states—this time with six elk, or 24%.

Pronghorn antelope

Let's take a look at the pronghorn—a species where the quality of the horns taken in Montana is not as well known as with the antlers of Montana elk. A quick review of the top 20 in Boone and Crockett reveals that four states had three or more listings: Wyoming with seven, Arizona with four, and Montana and New Mexico with three each. (The Montana records were taken in Garfield, Rosebud, and Sweet Grass counties.)

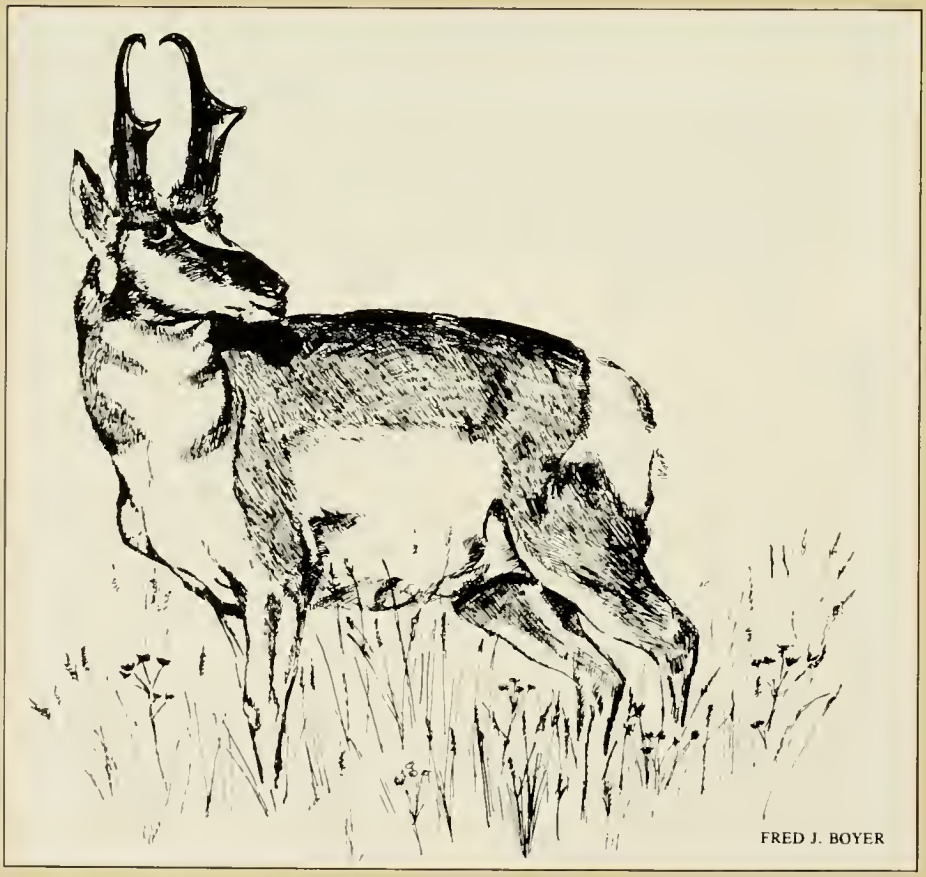
Of the four states with three or more super-trophies, only Montana has as many as three taken in the decade of the '70s.

Mountain bighorn

One of the hunter's most prized trophies has always been a bighorn ram. For many years, the advice seemed to be to seek the mountain bighorn in Alberta or British Columbia. But statistics compiled recently and records from the Foundation of North American Wild Sheep suggest pointing that compass needle toward Montana. Each year, the foundation awards first, second, and third prizes for the largest ram taken the previous fall for each of the four species of North American wild sheep.

Since records for 1982 are incomplete, let's look at the three previous years. Gold medals for 1979-81 were awarded for bighorn rams taken in Montana. In 1979, the gold medalist was Armand Johnson; in 1980, Alfred Journey and Bill McRae took first and third places, respectively, for their Montana bighorn rams, and in 1981, R.B. Swang, Jr. also took first prize. Three years of gold medals adds up to another big plus for wildlife management in Montana.

The policies of sound wildlife management are paying off everywhere. For trophy hunters, record-setting big game was more plentiful in the decade of the '70s than ever before. More important, hunters in Montana seeking these big game species have had more success than hunters anywhere else. ■



FRED J. BOYER

Some Classrooms Don't Have Walls

For the past several years, the Department of Fish, Wildlife and Parks and the Office of Public Instruction (OPI) have cooperatively provided outdoor education workshops for teachers. Content has varied—from environmental education and conservation to the shooting sports, from plant identification to backpacking, from aquatic studies to canoeing. Workshops have been aimed at both elementary and secondary teachers, with over 500 teachers attending one or more sessions during the past five years. The result has been seen in the classroom—in classrooms with and without walls.

Teachers have found that the outdoors is a medium through which many typical school subjects can be taught. Students can write a poem or short story about what they see on a hike. They can compute the distance and direction necessary to travel to a certain point. They can learn what to do if they become lost in the mountains, and they can learn how to live more harmoniously with the rest of their environment.

This year, the department and OPI have presented a new program to teachers: Project WILD. It is a "hands-on" program designed to help teachers develop ways of showing students the interdependence of all living things. The first workshop under Project WILD was conducted in Glacier National Park in conjunction with the yearly eagle migration, and 60 teachers attended.

We know that a picture can be worth a thousand words—and an experience can be worth a thousand pictures. Project WILD is divided into lesson plans for elementary as well as secondary students. Teachers can choose from a variety of activities, each of which reinforces another subject area. Students see firsthand how habitat affects wildlife, and eventually man himself. They learn important conservation principles, and clarify their own relationship to the environment.

Maybe the most important outgrowth of Project WILD is development of sound attitudes and beliefs concerning the environment. Studies conducted in several Montana schools have shown that, contrary to popular belief, the majority of students are not exposed to the outdoors.

Most do *not* fish, canoe, hike, or camp. Possibly, the attitudes and values which Project WILD helps shape will aid these students in dealing with the tough environmental issues they will face as adults.

Project WILD is used in teaching a variety of important conservation and environmental subjects. The program presents problems, suggests outdoor activities, and stirs the student's interest. Best of all, it's fun—it generates excitement and enthusiasm. The classroom—whether inside or outside—becomes alive, and students learn the basics of how to live in harmony with their environment.

For more information about Project WILD or Project WILD workshops, contact the Department of Fish, Wildlife and Parks, 1420 E. Sixth Ave.; Helena, MT 59620 (406/444-2535), or the Office of Public Instruction, State Capitol; Helena, MT 59620 (406/444-4434).—*Spencer Sartorius, health and physical education specialist, Office of Public Instruction*

Make A Check That Can Make A Difference

If you watch television or read newspapers, you've probably heard about the nongame tax checkoff. The Department of Fish, Wildlife and Parks and other concerned individuals are working hard to promote the checkoff and assure its success. But the "bottom line" for Montana's nongame animals depends on how you file your state income tax return in the next few weeks.

The 1983 Montana Legislature created a tax checkoff on your state income tax return to enable you to help many kinds

of wildlife—the kind you see when you are bird-watching, walking, camping, or simply enjoying nature. More than 500 kinds of animals are included—birds, mammals, reptiles, amphibians, and fish (animals not taken by hunters, trappers, or anglers).

The Nongame Wildlife Program will help to ensure the important role nongame animals play in a healthy environment, while benefiting all wildlife. This program is beginning just in time. Federal aid to states, which could finance more wildlife research, is being reduced. If Montanans are to preserve their wildlife heritage, they must do it themselves. The tax checkoff provides the means.

The funds raised by the tax checkoff will make it possible to convert your *concern* for wildlife into *action*. The checkoff is *not* part of your taxes (like the campaign checkoff); it is a voluntary contribution deducted from your refund and tax-deductible on the following year's return.

Depending on how much money is raised, contributions will be used for: producing educational materials for schools and the public, conducting studies to benefit the agricultural community, and gathering information on nongame wildlife to ensure that Montana remains the special place it now is. The department will ask for public comment to determine on which education and research efforts Montanans want their contributions used.

How does the tax checkoff work? Look for line 61, on page 2 of your Montana income tax return (Form 2). Check if you want to contribute $2, $5, or $10 of your tax refund to this program. If you file a joint or combined return, the other filer can also contribute $2, $5, or $10.

Every Montanan can join in helping sustain the state's unique wildlife heritage. With your valuable contribution, the department can plan a balanced effort to perpetuate all wildlife in Montana.

If you have already filed your return and forgot to contribute, you can do so by contacting the Nongame Wildlife Program, Montana Department of Fish, Wildlife and Parks, 1420 E. Sixth Ave.; Helena, MT 59620 (406/444-2535).

If you are just getting ready to file, make a check that can make a difference.

Wildlife Federation Seeks "Conservationist of the Year"

The Montana Wildlife Federation (MWF) is seeking nominations for the Mello-Ohrmann Award which recognizes Montana's "Conservationist of the Year."

The annual award of an original bronze sculpture by artist Bill Ohrmann recognizes the outstanding efforts of a Montanan in protecting wildlife and wildlife habitat. Nominees may be either a citizen conservationist or a professional in conservation work.

The award is a result of an agreement between the MWF, Missoula businessman Fred Mello, and Montana sculptor Ohrmann. Each year, Mello donates an original bronze sculpture of a Montana big game animal to the winner. This year's bronze will feature a grizzly bear and bighorn sheep.

The winner will be selected by a panel, with one representative from the MWF, one from the Department of Fish, Wildlife and Parks, and Mello. The winner will be announced at the federation's annual meeting and banquet May 12 at the Yogo Inn in Lewistown. Nominations should be

sent to Mello-Ohrmann Award, P.O. Box 3526; Bozeman, MT 59715 by March 31. They should include evidence of the nominee's activities and accomplishments in the field of conservation.

"Water—We Can't Live Without It"

Kermit the Frog, one of the internationally acclaimed Muppets, is honorary chairman of the 1984 National Wildlife Week. Sponsored by the National Wildlife Federation (NWF), the 46th annual wildlife week will be observed March 18-24. Its theme: "Water—We Can't Live Without It" will be promoted throughout the year.

More than 20 million students, teachers, and conservationists will participate in the observance, helping promote the importance of clean water and the necessity of conserving critical water resources.

As part of the observance, the Montana Wildlife Federation (MWF) has scheduled an essay contest for Montana's eighth graders. The contest is co-sponsored by the Montana Power Co. and the Montana chapter of the Telephone Pioneers of

America. Essays must be no more than 750 to 1,000 words on the National Wildlife Week's "Water" theme.

Winners in individual schools will receive certificates of achievement. Seven regional winners (based on the Department of Fish, Wildlife and Parks regional offices in Kalispell, Missoula, Bozeman, Great Falls, Billings, Glasgow, and Miles City) will each receive a $25 prize. The state winner will receive an expenses-paid trip to the MWF's annual meeting in Lewistown May 12 where a $100 prize will be awarded.

The essay contest deadline is March 19. For more information contact the Montana Wildlife Federation, P.O. Box 3526; Bozeman, MT 59715 (406/587-1713).

As you consider the importance of water to every living thing, consider also the words of NWF President Jay D. Hair about the selection of Kermit the Frog as honorary chairman: "Kermit is the perfect chairman for the 1984 water conservation theme. Kermit is immensely popular with millions of people of all ages—and besides, who knows more about the importance of clean water than a frog?"

More Than Firearms Safety

Montana's Hunter Education Program celebrated its Silver Anniversary in 1983, commemorating 25 years of firearms safety training. The 1958 law which brought the program to life was amended in 1963 so that no resident hunting license could be sold to anyone under 18 unless the applicant had completed the hunter education course. In 1973 the law was further amended to require that non-resident juveniles show proof of completing a firearms safety course in their home state or province before receiving a hunting license.

Since 1958, volunteer instructors in Montana have taught over 180,000 youngsters and many adults about the safe handling of firearms and about hunter responsibility. The effort is paying off—the number of hunting accidents in relation to the number of hunting licenses sold has steadily declined since Montana's Hunter Education Program began. Nationwide, fewer than 1 in 10,000 hunters is ever involved in a hunting accident.

Since those early days when the course dealt mainly with the basics of firearms handling and safety, it has evolved into a wide-ranging program delving into numerous subjects.

Today's hunter education students learn about ammunition, safe gun handling, and firearms care, storage, and history. They discuss basic principles of wildlife management and Montana's game laws. Students learn to identify the many different game species and to respect that game. They learn how to properly care for the game they might bag, including skinning so the animal could be suitable for mounting. Wilderness survival, first aid, and basic use of archery equipment are part of the course. Although it is not the purpose of the course to turn out expert marksmen, fundamentals of marksmanship are outlined. Last—but most important—the instructors attempt to instill sportsmanlike attitudes of courtesy and responsibility. And this is the most difficult of all subjects to teach.

Instructors must teach their classes that being a "sportsman" means much more than making a clean kill. It includes respecting game animals, making sure that none of the meat goes to waste, realizing that bloody game displayed on the hood or roof of a vehicle might offend some people, respecting the rights and property of landowners, leaving no litter or spent shells behind, and knowing that having a good day doesn't have to include "limiting out," but that it can mean simply enjoying the outdoors.

Hunter education courses are conducted at various times throughout the year in Montana, generally in spring and fall. The Department of Fish, Wildlife and Parks provides the course (at no charge), and each student receives a hunter education manual. To successfully complete the course, a student must pass a final written exam and demonstrate ability to handle a firearm safely. In some counties, students must pass a field test as well; these tests include situations the student might actually encounter while hunting.

Finally, the instructor must determine whether a student is going to be a safe, courteous, and responsible hunter at all times. The student's overall attitude plays a large part in whether he or she passes. This is a tremendous responsiblity for the instructor, and one that parents sometimes have difficulty understanding.

In Montana, about 650 of these dedicated men and women volunteer their time and effort to teach hunter education. As the word "volunteer" implies, compensation isn't in the form of money. It comes from the satisfaction of knowing that what they're doing is important, that their contribution is saving lives and positively influencing the attitudes and actions of Montana's young sportsmen and women.

Instructors devote countless hours, weekends, and evenings in working with prospective hunters. These volunteers are the backbone of the Hunter Education Program and thanks to their dedication, hunting in Montana is becoming a safer, more enjoyable sport.

It takes a special kind of person—one who's qualified as well as willing and able to spend the time required—to be a hunter education instructor. Thankfully, there are a number of Montanans who have taken the initiative and volunteered their services. As one instructor recently said, "I just love working with these kids. I enjoy hunting, and teaching young people about it, and I think hunter education is very worthwhile." Thanks to this special group of people, it *is* a valuable program, and thanks to them, it's working.

If you think you might have that special something it takes to become a hunter education instructor, contact any of the seven regional Department of Fish, Wildlife and Parks offices, or the Helena headquarters. Information is also available from department wardens, regional information officers, or local instructors.

Being a hunter education instructor is a lot of work—but it's a worthwhile and fulfilling experience.—*Chris Eby, coordinator, Hunter Education Program*

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MIKE ADERHOLD

MORE FOLKS BEHIND THE BADGE

by Mike Aderhold

Warden work has a lot of appeal. As long as he or she is productive, a field warden has an unusual amount of freedom in picking work days, hours, and tasks.

After a few years, wardens can usually select the equipment they need, and decide how they will handle routine work. Ninety percent of the work is outdoors—ever challenging, always different, usually interesting, and sometimes exciting. Most wardens are satisfied with the people they work for and with, and they get along well with the landowners and sportsmen they serve.

On the negative side, the hours can be long and uneven. Personal and family plans have a way of getting changed. The pay, while adequate and steady, seldom reflects the effort the job requires. The work can be dangerous, the paperwork tedious, and some of the case work frustrating. Almost all of the work is done alone, and constant self-supervision and motivation can be taxing. There is always more work than time, and more problems than solutions.

But, in balance, there is also a high degree of personal job satisfaction. Wardens enjoy their work, and that enjoyment is reflected in an annual turnover rate of less than 5 percent. There is a feeling of being needed, wanted, and useful. In most cases, there is community respect and an opportunity to grow and develop as a professional and individual.

Nationally, a warden is part of a select group of less than 6,500 officers, who have set a global standard for wildlife protection. In Montana, they know they are part of a proud tradition—a thin, green line of wildlife protection that goes back 82 years and has played a significant part in making our state's program one of the best in the country.

How can I become a game warden? The question is asked at least once a week. Usually by youngsters in the fourth and fifth grades caught up in the romance of wildlife and police work, or by teenagers planning their future, or by young men in their late 20s who have tried one line of work, become disillusioned, and are now doubling back. Sometimes the question comes from individuals in their

Department of Fish, Wildlife and Parks Warden Guy Shanks, who works around Bigfork, releases a mountain lion in the Swan Valley.

late 30s or 40s who have developed a career, but long for a little more action and excitement, or from retired police officers and military men who are simply too young to put their spurs on the wall. Rarely, the inquiry comes from a determined young woman pushing at the limits of traditional employment, or from an earnest young man with a long-standing dream of becoming a mountain man or a one-horse cavalry.

Many have the misconception that wardens work daily with wild animals. While they may see wildlife every day, wardens work mainly with people—individual hunters, trappers, and fishermen; sportsmen's groups; civic organizations; youth groups, and other members of the law enforcement community. Only occasionally do they handle wild animals, and this is why the state now selects individuals who show communication skills and have a record of working well with others.

Another misconception is that most warden work involves those who have violated the laws that protect wildlife. Actually, most of the work involves law-abiding citizens who simply have questions about wildlife, wildlife recreation and management, other kinds of outdoor recreation, or people who are having some kind of problem with wildlife. This is why, for 20 years, people have been selected who have a wildlife rather than a law enforcement background.

Game warden positions are scarce. Only two or three wardens retire each year. Recently, the Montana Supreme Court struck down the regulation requiring wardens to retire at 60. So, for a while, the number will drop to only one or two a year until new retirement standards are implemented.

New wardens are usually hired in the even years after the Legislature has authorized the positions and approved the Department of Fish, Wildlife and Parks budget. Right now, it looks like the next wardens will not be hired until 1986. State hiring regulations require open competition, and all positions must be well advertised. Notices are posted at college and university job placement centers and at Job Service offices.

To qualify for a warden position, one must be a citizen of the United States and have been a Montana resident for at least one year before applying. An applicant must be between 20 and 40 years old, and possess a Bachelor of Science degree in wildlife management or a closely related field. Interested individuals must be in excellent physical and mental health, with good vision, and they must be of good moral character, as determined by a thorough background investigation.

Applicants must demonstrate an interest in the protection, conservation, and propagation of wildlife. They must also be willing to submit to a battery of physical, mental, and personality tests.

Over the last 10 years, there have been from 75 to 90 qualified applicants for every four or five positions advertised. Before the degree was required, it was not unusual to receive 60 qualified applications for every opening advertised.

Since 1977, several warden positions have been filled by college students who enrolled in a competitive senior year warden trainee program. This program is designed to give students an opportunity to become acquainted with wildlife law enforcement as a career and to allow the department to review abilities of potential wardens. Regional warden captains in Billings, Bozeman, and Missoula have been responsible for field supervision of these trainees.

New wardens are on "probationary status" for one year, and permanent appointment is contingent on satisfactory performance during this first year. All new wardens are sent to a four-week training school conducted by the department, and all must take a basic law enforcement course taught at Montana's Police Academy. New wardens are usually—but not always—assigned to one of the regional headquarters for at least one year.

NEW GUYS

1 p.m., Chinook Area Warden Bob Winfield, 31, five years service; 2 p.m., Havre Area Warden Gary Benson, 29, five years service

"Where the heck you been? Everybody wants to know." Bob's wife Linda and Gary's wife Carol thought they were just going out on an evening patrol 41 hours ago. The Helena office has been trying to get in touch with them about a small administrative detail for two days. The warden captain was concerned that they were having vehicle trouble, and the supervisor was debating about putting an airplane up to look for them.

These two have matured and mellowed a little over the last four years. But when they first started, it was like there was no tomorrow. The future of the world depended on wrapping up *all* the wildlife violators today. Members of the June 1978 warden class, they both had thought about becoming wardens since they were 14.

Early in their careers, they came back from a Missoula workshop with T-shirts that said "Leo's Raiders," referring to their Warden Captain, Leonard Secor. Early success whetted their appetites for more game violators. Still learning their area and lacking contacts, they hit the road—3,000 and more miles per month.

In this particular case, they had headed out on what started out as a brief, two-hour evening patrol. They lost track of time and eventually got down into the Missouri Breaks and out of radio contact. They came across what they thought was a spotlighter, but the action turned out to be on the south side of the Missouri and they had no way to get across. They got stuck once, stopped to visit at several ranches, and, after several other minor adventures, they worked their way north again.

In the first six months on the job, they each racked up over 500 hours of "comp" time. At that rate, it seemed like they might qualify for retirement before they were 30. Most bet their marriages would fail even earlier.

Finally, when it looked like they were going to destroy their budgets, they were ordered—in writing—to limit their travel to 400 miles a week and their "comp" time to 10 hours per pay period. Within 30 days, both Linda and Carol were expecting. By the time the babies were born, the new guys began to level out. The veterans just shook their heads and mumbled something about wasting all that energy on the young.

NEW DISTRICT

3 p.m., Eureka Area Warden Jim Roberts, 30, three years service

Jim Roberts is the new warden recently assigned to an established warden district around Eureka. At this point, he's pretty much an unknown resource, but the word going around is that he's off to a good start.

Jim, a Libby native, became a warden in July 1980, and served in Bozeman for 2-1/2 years. He was then transferred to Glasgow. He served there seven months before winning the vacant slot in Eureka. He came to northwestern Montana well recommended. Single, energetic, eager to learn, he is the ideal candidate to take over a vacant warden district. Tall, with long, curly hair and a Fu Manchu mustache, he is also easy to pick out of a crowd.

No matter what an individual's experience, or where or how he or she has worked in the past, when you take over a new district, there's a kind of apprenticeship or initiation to be served and endured.

Like it or not, you are up for review and ripe for judgment. Generally, the smaller the community, the faster the word travels about a new warden's past, early work, personality, initial successes, and failures. Ability, judgment, and courage are all questioned. I don't think there is a state job away from Helena that receives more scrutiny.

Few new employees are more alone than a new district warden. In Jim's case, the nearest warden is 50 miles away. On his own, he must begin to earn the trust of the local law enforcement community, county attorney, and justice of the peace. He must learn the country so—in the language of the old hands—he can "feel" when things are not right. He needs to introduce himself to the farmers and ranchers and get to know those in the community who best represent the opinions of local sportsmen.

It all takes time, and the phone starts ringing the first day. You make mistakes and false starts. There are always those you don't please, probably right from the beginning. According to the veterans, it takes three or four years before you begin to feel comfortable and know you have the confidence of the community.

The work never develops into a routine because there are too many variables. As you mature in understanding enforcement tactics, fish and wildlife biology, forest and range management, and people, you become less of a cop and more of a conservationist. The best wardens eventually develop self-restraint, balance, humility, humor, and more than a little wisdom.

MIKE ADERHOLD

Wardens Bob Stordahl, Glasgow (left); Gary Benson, Havre (center), and Parks Division employee Curt Dyer demonstrate some of the evidence seized in a bobcat poaching case.

The most common problem with all wardens is the one of juggling the work load with the time available. The more work you do, the more work that comes in. Some calls you can forget, some can wait as long as a week, and some have to be taken care of immediately. Deciding those priorities is part of the job. Some try to do it all, and they lose every time. Either their marriage goes sour, or they develop health problems, or they get cranky and just quit answering the phone. The problem is endemic to law enforcement.

TWO GUYS FROM LIBBY

4 p.m., Libby West Area Warden Harold Burrell, 48, 18 years service; Libby East Area Warden Gary Burke, 42, 16 years service

Libby is an outdoor town with lots of hunters and fishermen. It has an active rod and gun club, a growing bird club, a new fly-fishing organization, and one of the best hunter safety programs in the state. It also has two well-qualified wardens: Harold Burrell, who covers the Yaak drainage in the northwestern corner and most of the Scotchman Peaks area, and Gary Burke, who covers the east Cabinets and works north and east of Libby around Lake Koocanusa and the Fisher River country.

It takes all kinds of people to make a warden force, and these two are as different as any two on board.

A solid 6-foot-3, 220-pounder, Gary Burke looks like an Olympic shotputter. Hale and hearty, with twinkling eyes and a quick laugh and outgoing personality, he's the classic extrovert. He has a knack for telling a good yarn and keeps track of the latest jokes and one-liners.

Gary probably has had more formal police training and experience than any officer the department has. He has a degree in police science and adminstration, and went through the Los Angeles Sheriff Academy's stress training and advanced programs for riot control, sniper control, and supervision. He was with the Los Angeles Sheriff's Office a little over five years, with 2½ years in the jail division, one in criminal patrol, and two in undercover vice work. But there was too much Montana in the Deer Lodge native, and he came home in 1968 to become a warden.

Gary adjusted well to check stations, campground problems, and fishing violations, but he still goes out of his way to help the sheriff's office with situations requiring fast action.

Harold Burrell majored in biology, history, and English, and did advanced work in secondary education. Before becoming a warden, he was a teacher, coach, and principal—all at the same time—in Paradise, Mont.

A serious, academic type, he is quiet, efficient, and generally runs a low-key operation. He likes working the more remote areas of his district and enjoys the time he can spend with his family. He likes to talk about local history, the area's wildlife, and his children. He is active in Montana's student exchange program, and he and his family have hosted students from Vietnam and Turkey.

Harold became a warden in 1965 and is now the senior field warden in northwestern Montana. For 2-1/2 years, he worked out of Glendive in a warden district that covered parts of seven counties and over 10,000 square miles. During those years, he patrolled up to 5,000 miles per month.

Harold has worked in Libby since 1972, and has a biologist's understanding of the area's wildlife. He works the Canadian and Idaho borders and has made some good cooperative cases. He also works especially well with landowners.

As different as they are in interests, personality, and enforcement style, these two work together effectively. They appeal to different kinds of people and to different groups. They augment each other's contacts and coverage of the area. They also enjoy the added and unusual luxury of being able to spell each other from time to time.

BACKCOUNTRY WARDEN

9 p.m., Kalispell Warden Sergeant Floyd Thomas, 47, 17 years service

It has been seven summers since backcountry warden Lorney Deist retired, but people in the outback still remember him. For 30 years, he packed the mail, carried supplies, and checked hunters and fishermen in the million-acre Bob Marshall Wilderness. He traveled alone and at night, and he would drift into camps out of the early morning mist like some modern-day Jeremiah come to check their souls.

Today, backcountry horse work is a relatively small, but still vital, part of the department's law enforcement effort. It is one of the most romantic, and also most difficult, jobs, and it is the work most fourth and fifth graders and discontented 30-year-olds dream of when they ask about becoming game wardens.

In 1983, game wardens spent about 1,400 hours in the saddle. You can count on one hand the wardens who did most of the packing and riding: Bill Maloit, Helena; Larry Davis, Lincoln; Bud Hubbard, Bozeman; Hank Fabich, Livingston, and Floyd Thomas of Kalispell. Russ Marchington, Hamilton; Bryce Christensen, Red Lodge; Gary Chambers, Superior, and Ron Carlson, Big Timber, also did some horse work, but not as much as the first five.

Floyd Thomas is the only one I know well. He grew up in Cut Bank, and as a teenager packed and guided in what is now the Great Bear Wilderness. He joined the Cut Bank Police Department, and over four years worked his way up to captain. In 1966, at age 29, he became a game warden. Floyd served a year in Miles City and then was assigned to the Big Timber Warden District. There, in his off-hours, he worked with the Boy Scouts, Sweet Grass County Sheriff's Posse, and with the young people in Montana's Junior Rodeo Program. He patrolled with wardens Joe Gaab and Hank Fabich in the Absaroka backcountry and was well on his way to becoming a near-legend like Lorney Deist. He was so good, he was promoted and transferred to Kalispell as the Region One sergeant.

The sergeant positions were created in 1963 to take care of special enforcement projects and extended investigations. Today, there are five sergeants. In Kalispell, Floyd is responsible for 85 outfitters and 150 guides. He administers the outfitter licensing program and investigates outfitter complaints. He also works on wildlife damage complaints, boat safety, and detailed investigations in the Flathead Valley.

The backcountry position that Lorney Deist had was cut in an austerity program in 1980. While Floyd does his best to cover the area, it is only part-time, and not really the same. He makes two or three 10- to 15-day loops a year through the "Bob" and Great Bear and responds to calls.

One Saturday morning last June, Floyd had started out to work boat safety when he got a call from the Spotted Bear Ranger Station about an elk kill deep in the Bob Marshall Wilderness. He lined up a plane that afternoon and flew into the Schafer Meadows airstrip—bringing his saddle with him. He borrowed a horse and mule from the Forest Service, rode six miles to the violation, investigated the situation, collected a rifle and the dead elk, served some paper, and was back at the airstrip by dark. While he waited out a storm, he checked some hunting camps in the area and was back home Sunday night.

Wilderness use increases every year. The outfitter's association and Forest Service rangers continually ask for more backcountry patrols. Increased use of phones, radios, vehicles, and airplanes has cut backcountry horse work in half the last 10 years. But it's still a vital component—and one of the most adventure-filled—of the department's law enforcement efforts.

DEAL 'EM

Midnight, Captain Leonard Secor, 61, 27 years service

Captain Leonard Secor retired the summer of 1982. He had turned 60, and regulations on the books at the time re-

quired him to take his leave. In 1983, a Montana Supreme Court decision eliminated this requirement, and Captain Secor came back to work. One of the best, for more than 17 years he has been Mr. Fish 'n' Game in the northeastern corner of Montana.

He started out in Sheridan. In 1965, he was transferred to Glasgow, got his captain's bars, fell in love with the country, and just stayed. He's been a hotshot in the local softball league, put four children through college, and the last five or six years, has been elected by the people of Glasgow to help direct the most important industry in town—the local school system.

Leo is amazingly close in style, appearance, and temperament to the amiable Sgt. Phil Esterhaus on the popular TV police show, "Hill Street Blues." He is soft-spoken, with a disarming wit; an easy, relaxed, "hold-your-horses" attitude, and a kind of philosophical acceptance of whatever problems come through the door. Some said this was due to a close encounter with death during the Second World War. I don't know about that, but for the almost eight years I worked with him, I never once saw him get his feathers up.

Eight or 10 times a year, it is Leo's habit as captain to visit one of his wardens—on the warden's turf. He takes supplies, looks at some specific spot in the warden's district, visits with the warden's family, has a meal or two, and generally talks out problems and assesses upcoming difficulties.

Once or twice a year, he gets his crew of seven together and they go fishing, barbecue some steaks, maybe have a beer or two, and trade experiences. Later in the evening, Leo puts on his green visor and he and old pros like Dave Cooper and Leonard Christensen of Havre show the new guys how to play penny ante poker. These lessons always cost the new guys, but what they lose in change, they more than make up in tips on how to better handle their work.

I asked Leo before he retired the first time what he thought of warden work and his own career. He thought some, then said that warden work is hard on a family, and hard on one's personal time, but it is interesting, challenging, and sometimes even fun. He said he enjoyed most of the hunters and fishermen he encountered, and just about everybody he worked with. Given another chance, he'd take the same cards again.

MIKE ADERHOLD

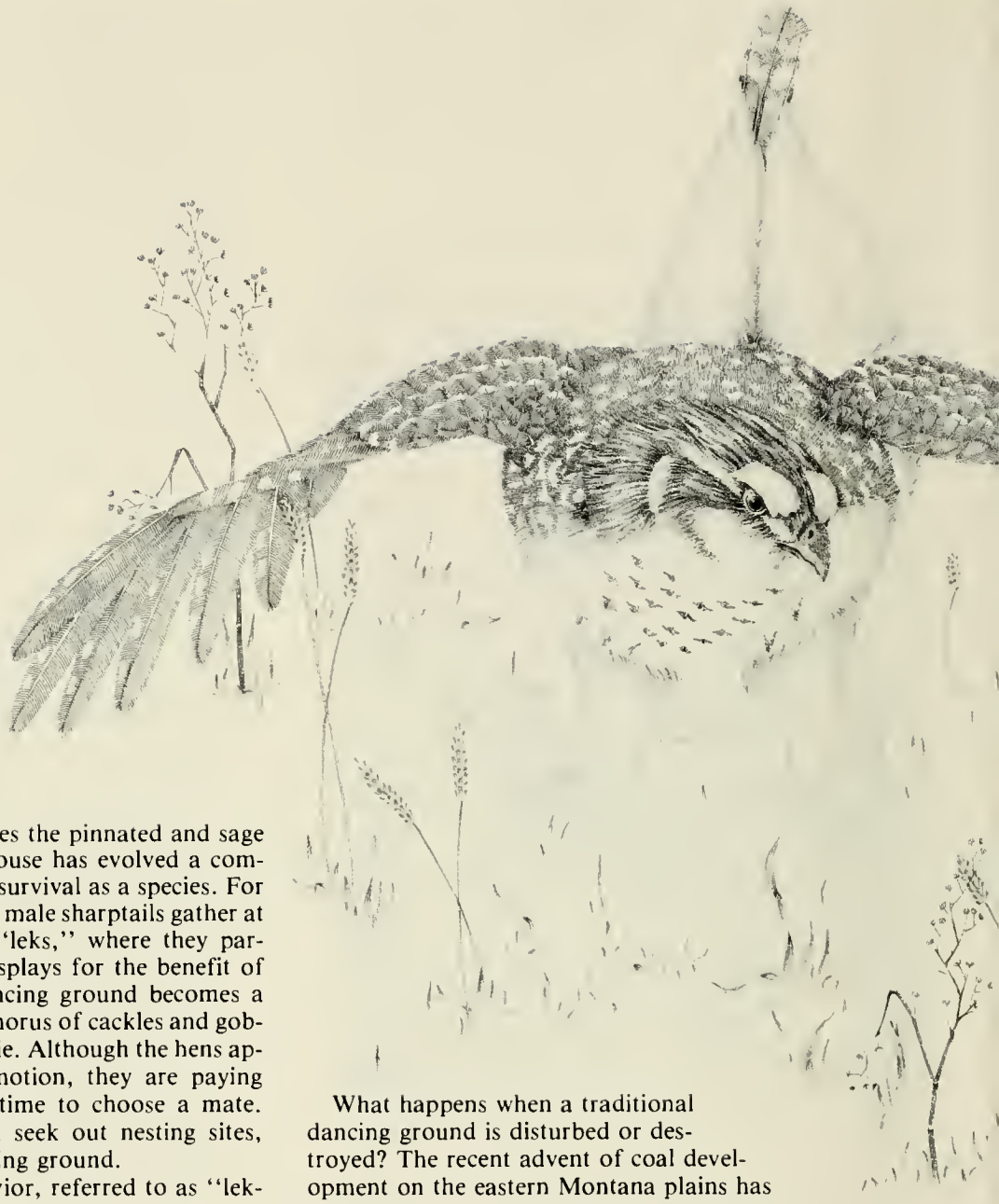
One of five warden sergeants in the state, Floyd Thomas here auctions confiscated game meat. Headquartered in Kalispell, Thomas is a part-time backcountry warden, making two or three loops a year through the Bob Marshall and Great Bear Wilderness Areas.

* * * * *

• *In these three articles on "The Folks Behind the Badge," I have used vignettes from the lives of individual wardens to give an added dimension to an impressive collection of law enforcement facts and figures. I also wanted to give the reader a peek at the varied backgrounds, personalities, and different styles of those we entrust with protecting our wildlife. They are a well-qualified, dedicated, hardworking group.*

With one exception, I wrote about individuals I have worked with almost daily during the past 10 years—both in northeastern and northwestern Montana.

The drawback in singling out individuals is that there are many just as deserving who are not recognized. I assure the reader that I have no reason to believe that the 19 wardens about whom I wrote are unusual, or in any way more qualified than those I didn't cover. It was simply a matter of time and magazine space—and I wish it were possible to write a section about each one.—Mike Aderhold ■



Over the eons, like its relatives the pinnated and sage grouse, the sharp-tailed grouse has evolved a communal mating ritual to ensure its survival as a species. For several weeks in March and April, male sharptails gather at traditional dancing grounds or "leks," where they participate in elaborate courtship displays for the benefit of demure hens. At dawn each dancing ground becomes a noisy beehive of activity, with a chorus of cackles and gobbles reverberating across the prairie. Although the hens appear indifferent to all the commotion, they are paying close attention, for it is nearly time to choose a mate. Shortly after breeding, they will seek out nesting sites, usually within a mile of the dancing ground.

This communal breeding behavior, referred to as "lekking," is unusual in the animal kingdom, although it occurs in a few species of mammals, fish, and frogs. The work *lek* is a Swedish word derived from *leka,* meaning to play. It has been postulated that sharptail leks evolved to aid the birds in finding mates in the vast expanses of prairie they inhabit.

An observer of the sharptail's lekking activity is struck by its ritualistic, almost mechanical nature. Males appear to be wind-up toys, whirling in full and half circles with wings outspread, heads lowered, and tails pointed skyward. Their display activity seems to be coordinated, with the majority of the birds dancing and stopping at precisely the same time.

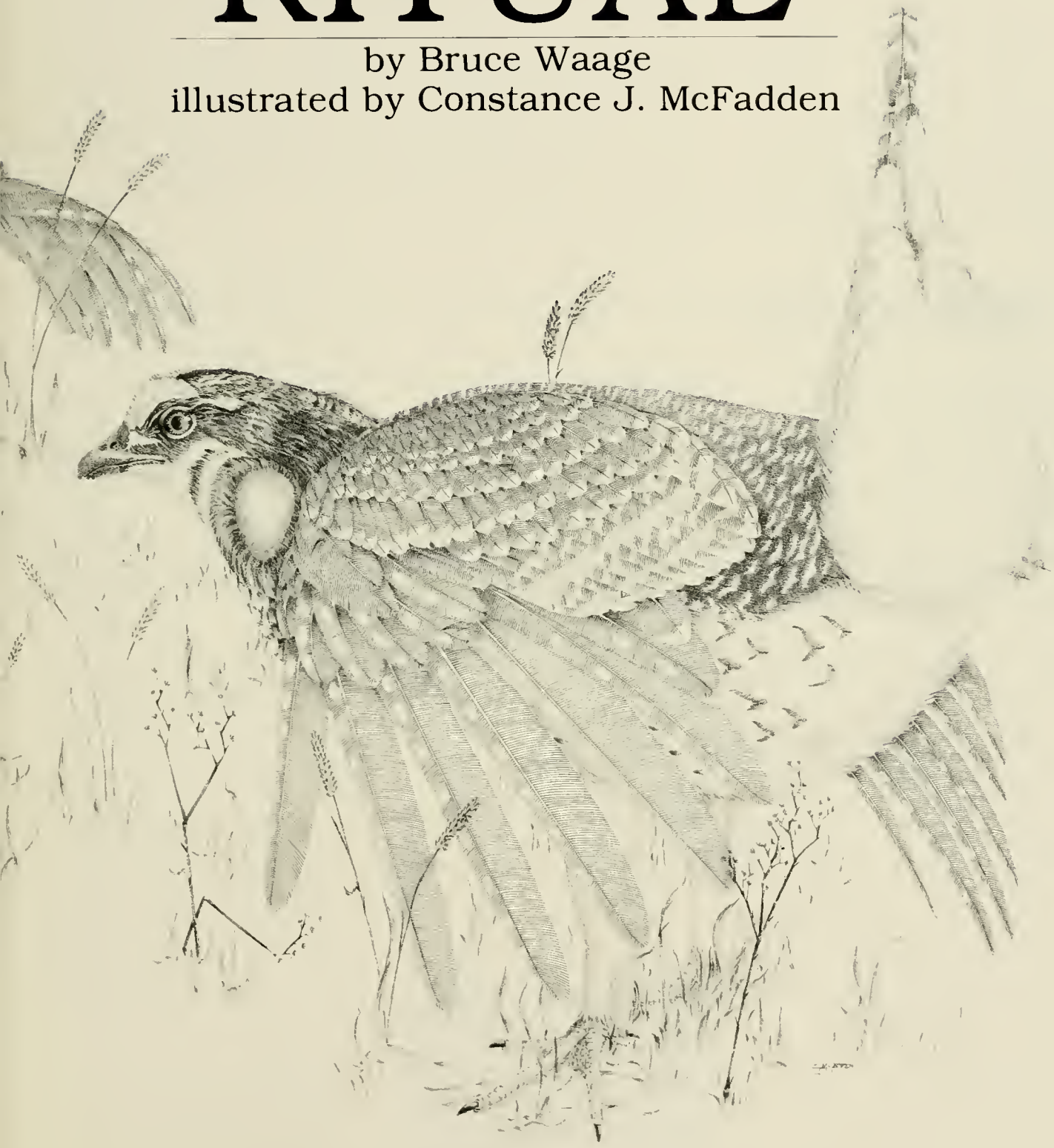
Sharptails attend the leks in the fall as well as in the spring, although with less vigor. This is explained by the fact that the breeding impulse is triggered by changing day length—when the day length in the fall approximates that in the spring, grouse return to the lek for a short time.

What happens when a traditional dancing ground is disturbed or destroyed? The recent advent of coal development on the eastern Montana plains has given this question a heightened importance. In an attempt to answer this and related questions, beginning in 1975 the Montana Power Co. and the Western Energy Co. funded several studies of grouse biology. Among other things, researchers wanted to determine if sharptails could be encouraged to (1) relocate their dancing grounds away from proposed mine sites, and (2) establish new dancing grounds on reclaimed land after mining. The latter had never been documented, although sharptails have been known to use reclaimed areas for roosting, nesting, brood rearing, and feeding.

In the spring of 1976 a substitute lek site in an area of native range was chosen to see if grouse could be attracted from a nearby proposed mining area. In addition, two substitute dancing ground sites were selected in a reclaimed area. All sites were on elevated knolls, and the sites in the reclaimed area were mowed to provide openings in the

RETURN OF A RITUAL

by Bruce Waage
illustrated by Constance J. McFadden



grass cover.

The methods used to attract the birds included: (1) a cassette tape recording of grouse display sounds; (2) speakers with 50-foot cords that could be powered from the battery of a truck parked nearby (later, an automatic system powered by a car battery, self-contained in a wooden box, was used, eliminating the need for a researcher to set up the system every morning); (3) 24 decoys depicting grouse

The results to date have been promising. Displaying grouse were successfully attracted to the native range site, but the birds did not establish a permanent dancing ground. On the reclaimed land, however, in the spring of 1982 grouse were discovered to have established a dancing ground. Seven males and three hens were present throughout the breeding season in the spring. The grouse picked their own site very close to the speakers and in the direction the speakers were broadcasting. The grouse returned to the site in the fall of 1982 even though the speakers were no longer operating.

In the spring of 1983 the grouse returned again to the reclaimed site. Such areas provide secure brood-rearing habitat due to the grass cover. This may contribute to greater survival of young birds, and it is expanding grouse populations that initiate new dancing grounds. While more time will have to elapse before we can fully evaluate the potential of dancing ground relocation, we are hopeful that with a little help from man the spring ritual of the sharp-tailed grouse can be perpetuated on mined lands following reclamation. ■

Contributors

Over the last 20 years, almost without notice, the black bear has become a valued game animal. In terms of days of hunting recreation, it now ranks fourth, behind elk, mule deer, and white-tailed deer. Using the U.S. Fish and Wildlife Service figures for the average cost of a day of bear hunting, the black bear in Montana is now worth—every year—at least $2.2 million. Turn to **Mike Aderhold's** "Montana's Million-Dollar Black Bears" on page 6. He has also compiled a related article (page 36), "Know Your Bears," which explains how to distinguish between black and grizzly bears. As he emphasizes, if you're in doubt, don't shoot. In this issue, Aderhold also ends his three-part series on the department's law enforcement officers. Turn to page 15 for "More Folks Behind the Badge" and profiles of: Bob Winfield, Chinook; Gary Benson, Havre; Jim Roberts, Eureka; Harold Burrell and Gary Burke, Libby; Floyd Thomas, Kalispell, and Leonard Secor, Glasgow. Aderhold is the department's information officer in Region 1 (Kalispell).

* * * * *

The latest edition of Boone and Crockett's "North American Big Game" reveals that hunters are continuing to take trophies at a record pace, particularly in Montana. For example, the recent edition reports that 10 new elk listings were added to the cumulative top 100; of those 10, *four* were taken in Montana. For "More Nuggets Panned from Boone and Crockett," turn to page 11 and the update by **Norman C. Roettger, Jr.** Roettger is a U.S. District Judge in Fort Lauderdale, Fla., and lists big game hunting as one of his hobbies. He has hunted big game in Montana since 1975, and we're pleased to share his survey results with our readers.

The illustration for the Boone and Crockett article comes from Anaconda-based artist **Fred Boyer.** He grew up against the rugged splendor of the Pintlars, and his long hours studying the habits of wildlife are evident in his work. Teaching art, first in Sitka, Alaska, and then in Anaconda, has enabled Boyer not only to enhance his own skills, but also to share his talent with the young. His superb wildlife bronzes, vivid illustrations, and original custom jewelry have been displayed in shows and galleries nationwide. Two of his pieces were accepted for the 1983 "Art Annual Four" show at the Oklahoma Art Center in Oklahoma City.

* * * * *

What happens when a traditional sharptail dancing ground is disturbed or destroyed? Turn to "Return of a Ritual" by **Bruce Waage** for a fascinating account of an attempt to do something never documented before—to establish new dancing grounds on land reclaimed after mining. Waage is a wildlife biologist working for Western Energy Co. in Colstrip. Turn to his article on page 20.

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Constance J. McFadden of Latrobe, Penn., has been a wildlife illustrator for several years. Her work illustrates "Return of a Ritual." She has shown her work widely, ranging from exhibits sponsored by the Audubon Society to Hawk Mountain Sanctuary, and has donated art to wildlife organizations, most recently for efforts to preserve the bald eagle. She uses ink and pencil and notes she approaches her work "in a stylized fashion, trying to capture the most expressive portion of the species." She is self-employed at C.J. Graphics and Design, Inc. We're pleased to welcome her work.

* * * * *

A department survey in 1975-76 documented the popularity of Canyon Ferry Reservoir—it was the most heavily fished body of water in the state. But after several years of spectacular rainbow trout fishing, the fishery collapsed in 1982. Turn to page 24 and "Rainbows on the Rebound?" for an examination of what happened, and a prediction about what the future could hold. As **Bruce Rehwinkel** and **Jerry Wells** note, fisheries biologists may never know *all* of the reasons for the rainbow trout fishery's demise, but some plausible theories are explored. Rehwinkel is a fisheries biologist for the department in Whitehall; Wells is a fisheries manager for Region 3 (Bozeman).

* * * * *

Although many subscribers will recognize the name of **Mike Logan** because of the many fine photographs he's shared with them over the years, this issue marks his first attempt at a piece combining both his "picture" and "words" skills. "Sentinel" is the story of a man and his dog sensing the ghosts of a sheepherder and his dogs at a special place. As Logan wrote of his attempt, "I find myself looking at my hobbies of hunting, fishing, and photography, and wishing I could share the beauty I see. Occasionally, the words and pictures just seem to come together." When you turn to page 34, we think you'll agree. Logan is a teacher at Capital High School in Helena.

* * * * *

Montana Outdoors would like to thank the following photographers for their contributions to this issue: **Gene Fischer,** Helena; **Louis M. Kis,** Kalispell, and **Neal Mishler,** Great Falls.

Readers Respond

September Articles: Excellent

I am writing for two reasons, both of which relate to the enjoyment and satisfaction I receive from reading *Montana Outdoors*. I just finished reading the Sept./Oct. 1983 issue and want to express my appreciation to you and your staff for a job well done. I can't say this particular issue is any more spectacular than the others—because they are fantastic. But having just left Montana for a year's assignment in Washington, D.C., *Montana Outdoors* has brought a special "I wish I were home" feeling to me. Thanks for that special treat! You have simply reinforced my appreciation for such a fantastic state.

Second, I would like to congratulate the staff for the excellent articles in this Sept./Oct. issue. I was significantly impressed by A. David Cannavina's "The Silver-Tipped Sweater." It reminded me of how all too often we are overly anxious to be a success, without taking time to gather all the details first. Robert W. Moon and Thomas R. Whiddon ("Getting Ready") simply reinforced my actions and activities, making me feel as though maybe I'm doing something right.

Most impressive was Ken Walcheck's article, "Sodbusting in Montana: A 1980s Dust Bowl?" He did an excellent job and apparently was willing to address an issue many have tried to bring attention to, but most have not been willing to "take the heat." I was impressed with both his research and his willingness to write it the way it is.

Something needs to be done. Although many of us recognize the problem, few of us understand just how to go about focusing attention on the real issues. Maybe Walcheck's research will make others besides public officials realize that Montana possesses a resource unmatched in any other state. Without careful management, that resource—our land—will become useful to only a few. In many instances, the actions of land management today will serve only short-term economic benefit for the immediate landowner. Long-term, multiple-use land management must be given highest priority, even if it means legislative action in some cases.—*Dr. James W. Bauder, extension soil scientist, Conservation Tillage Information Center; Washington, D.C.*

Ruined Trip

Six other guys and I traveled 1,800 miles one way to hunt in your state last year. We all hunted hard for two weeks. On Thanksgiving Day, I shot a spike bull elk. This was the only elk that any of us saw, and it was the second one I have ever killed. We took it back to our camp at Ruby Creek Campground and hung it up. The next day, we went back out hunting. There were only three days left in the season. We left camp about 7 a.m. and came back about 11:30 for lunch. When we pulled into camp, we saw the elk was gone. Someone had come right into our camp, backed their vehicle up, and loaded my elk. I never thought this would happen. This meant I couldn't take any elk meat home.

This really took the thrill out of our trip and gives hunters a bad name. I've hunted in other states and never had this happen—and I hope it will never happen to you.—*David Watkins; Milan, Ill.*

Clark Fork Wins

I am writing in regard to Glenn Phillips' article, "A Clark Fork Prognosis," in your Nov./Dec. 1983 issue. I thought it was a very good and well-written piece. The Clark Fork happens to be my favorite river for both recreation and beauty.

I believe Mr. Phillips' opening statement: "More water leaves Montana via the Clark Fork than from either the Missouri or Yellowstone. It is Montana's largest and mightiest river...." will raise many eyebrows. I believe that he must know whereof he speaks, but some of my co-workers doubt the veracity of the statement. They say "No way," that both the Missouri and Yellowstone carry more water out of Montana. Can Mr. Phillips come up with some figures to quiet those skeptics?—*Gordon Church; Missoula, Mont.*

• He can indeed: *"I appreciate your friends' skepticism regarding my statement. I, too, was skeptical when I first learned this interesting fact from Loren Bahls of the Montana Department of Health and Environmental Sciences, Water Quality Bureau.*

"The average annual flow of the Clark Fork near Whitehorse Rapids, based on 54 years of continuous measurements by the U.S. Geological Survey, is 22,470 cubic feet per second (cfs). Comparatively, 32 years of recordings in the Missouri River near Culbertson and 70 years of measurements in the Yellowstone River near Sidney yield average annual flows of 11,040 and 13,080 cfs, respectively. Thus—remarkably—the Clark Fork transports nearly as much water as the Yellowstone and Missouri rivers combined.

"It should be remembered that the annual precipitation and runoff rates are considerably higher on the west side of the Continental Divide than on the east. Average annual precipitation rates of 40 to 50 inches per year are common on the west, where most of Montana east of the divide receives considerably less than 15 inches per year.

"I hope this satisfies your doubting friends, and I am pleased you enjoyed the article."—Glenn Phillips

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Magazine Impresses Biologist

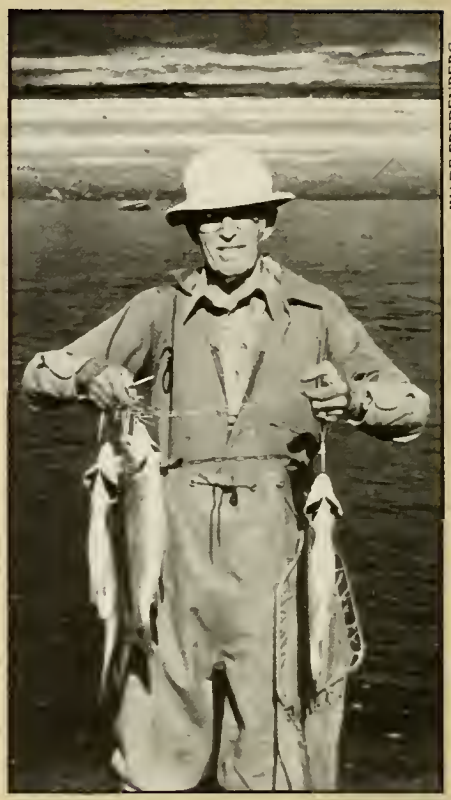
In August 1983, I had the opportunity to travel through northwestern Montana. While staying at the Big Arm Recreation Area at Flathead Lake, I was given several back issues of *Montana Outdoors* by the camp superintendent.

As a professional biologist in Canada, I am impressed at the quality of your publication. It appears to go a long way toward bridging the gap between those who research and manage our environment, and the average person who appreciates and uses the outdoors. A similar publication is lacking in Alberta, even though we have abundant wildlife habitat and a need for this sort of communication.

As a tourist, I have been interested to see articles about natural areas in Montana and information on cross-country skiing, etc. I am encouraged to spend more of my leisure time—both summer and winter—in Montana.—*Frank Geddes; Edmonton, Alberta.*

Canyon Ferry: RAINBOWS ON THE REBOUND?

by Bruce Rehwinkel and Jerry Wells



WADE FREDENBERG

During the late 1970s, Canyon Ferry Reservoir near Helena was widely known for its excellent rainbow trout fishery. A fishing survey conducted by the Montana Department of Fish, Wildlife and Parks in 1975-76 verified Canyon Ferry's popularity—it was the most heavily fished body of water in the state.

Although fishermen had the greatest success in spring, both the midsummer and ice fisheries yielded scores of satisfied anglers. As if this wasn't enough, the "icing on the cake" was a fall rainbow run into the Missouri River unparalleled for fishing success.

After several years of spectacular rainbow trout fishing, the fishery collapsed in 1982. As a result, in fall of that year, the department began to focus considerably more attention on this resource.

To understand the present status of this fishery and what we might expect in the future, we should first take a look at the fisheries management history at Canyon Ferry. Beginning in the mid-1960s, biologists conducted several years of sampling to determine the least expensive, most efficient means of maintaining the Canyon Ferry rainbow trout fishery. This led to the decision to plant "subcatchables" (rainbows 4 to 6 inches long) in the spring. Although this presented a challenge to the hatchery system, it ultimately was accomplished. This management plan resulted in good fishing and satisfied anglers. Although some years were better than others, all were considered acceptable to an ever increasing number of anglers.

In the mid-1970s, a fall run of rainbow trout up the Missouri River was "discovered," and this fishery rapidly expanded. Wade Fredenberg (then a graduate student at Montana State University, now a fisheries biologist for the department in Billings) worked on a partial creel census of this fall rainbow run. His data showed that during 1978, fishermen harvested nearly 8,000 rainbows, and spent 12,000 hours fishing. The "average" fish taken in this run was over 16 inches long and weighed nearly 2 pounds. Fredenberg's work suggested that size of the run and penetration into the Missouri River was related to magnitude of the fall flow—higher flows resulted in greater runs.

In the years that followed, fall electrofishing in the Missouri River between Townsend and Canyon Ferry Reservoir showed somewhat lower numbers of rainbow trout over 13 inches. Biologists believed this was related to lower fall river flows. During fall 1982, flow in the Missouri was excellent, but the rainbow run was approximately one-fourth the 1978 level. Spot creel checks indicated that fisherman success and fisherman use were very low.

It was then the department became convinced that problems had developed in the rainbow trout fishery at Canyon Ferry and decided to focus a major effort on resolving those problems. The program included a partial creel census of the entire reservoir during all of 1983. In addition, gill netting situations from the 1950s and '60s would be duplicated so biologists could compare fish numbers, composition of each species in the catch, and information on age and growth.

At this writing, all of the information hasn't been analyzed. All of the questions haven't been answered, and some of the intricacies of what happened may never be unraveled. But some important facts were discovered.

The rainbow trout fishery in Canyon Ferry depends on annual stocking, and the type of rainbow that has been stocked is called the "Arlee strain." This fish has relatively high catchability, rapid growth, and a rather short life span. In Canyon Ferry, the Arlee rainbow appears to live to a maximum of two to three years, while other wild rainbow

strains have been found to live six or seven years.

Arlee rainbows are hatched in state and federal hatcheries in various locations around Montana, reared to the subcatchable length of 4 to 6 inches, and stocked into Canyon Ferry in late spring and early summer. These rainbows grow very rapidly, but they do not contribute much to the fisherman's creel during the first year. As yearlings, these fish measure 12 to 14 inches long, and fishermen begin to catch them. In fall, they enter the run up the Missouri River, and do so again the following year. Some time between 2½ and 3½ years of age, natural mortality appears to claim the majority of the fish that run up the Missouri River at age 2½. Through tagging, biologists have learned that only about 1% of the fish 2½ years old survive to 3½ years.

A rainbow trout captured in a gill net is weighed and measured. A sample of its scales is also taken to enable biologists to determine its age. Information gained from gill netting helps biologists evaluate survival of planted fish, growth rates, and food habits.

GENE FISCHER

Efforts in 1983 were directed at two areas: (1) creel census (not yet complete), and (2) biological sampling of the fishery.

During June and August of 1983, 33 gill net sets were made on the bottom of the reservoir. They were made at the same depths and locations as sets done previously, dating back to 1955. All the fish netted were measured, weighed, their species determined, and scale samples taken to determine age. In addition, biologists made 22 floating gill sets.

Over 4,000 fish were sampled. Other than rainbows, all fish were represented in percentages close to those found in previous years' sampling. The rainbow trout, however, was only about one-fourth of its documented peak in 1968. In addition, the individuals represented in the 1983 sample were younger and therefore smaller. To compare to past collections, average length was used because of the wide range of rainbow sizes stocked in the past which thoroughly confused age analysis. In past collections, rainbows averaged between 15.9 and 16.2 inches; rainbows in the 1983 sample averaged 9.4 inches. This indicates few older, large individuals in the population, and emphasizes the large proportion of fish stocked in 1983 in the population.

This evidence underscored biologists' belief that the previous two years' plants—which would have made up the rainbow fishery in 1983—experienced considerable mortality before 1983. In general, if one year's plant completely failed, the rainbows available to the angler would be reduced 50%. If two consecutive plants totally failed, Canyon Ferry would essentially be out of catchable-sized rainbows.

The obvious question is what happened to the 1981 and '82 rainbow plants. Biologists may never know the exact answer, but we have two plausible theories.

In spring and early summer of both 1981 and 1982, large amounts of water were spilled from Canyon Ferry Reservoir through radial gates which draw their water from the 25- to 30-foot depth. Add to these spills the Arlee strain's tendency toward downstream migration and you have the possibility that many rainbows might have escaped from the reservoir. Tagged fish from the reservoir were found below the dam in both 1981 and '82, and as far back as 1964. But the magnitude of those losses has never been documented. To help in assessing this situation, all fish stocked in Canyon Ferry in 1983 have been marked with an antibiotic mixed into their food. This leaves a translucent ring in their bones and enables biologists to identify them.

A second possible explanation for collapse of the rainbow population could be disease. In 1980, a private commercial hatchery that was going out of business offered the department free subcatchable rainbows. After these fish were stocked in 1980, the department learned that fish in the facility had two diseases. However, during summer 1983, when the department's fish pathologist sampled the collected rainbows, he couldn't find disease.

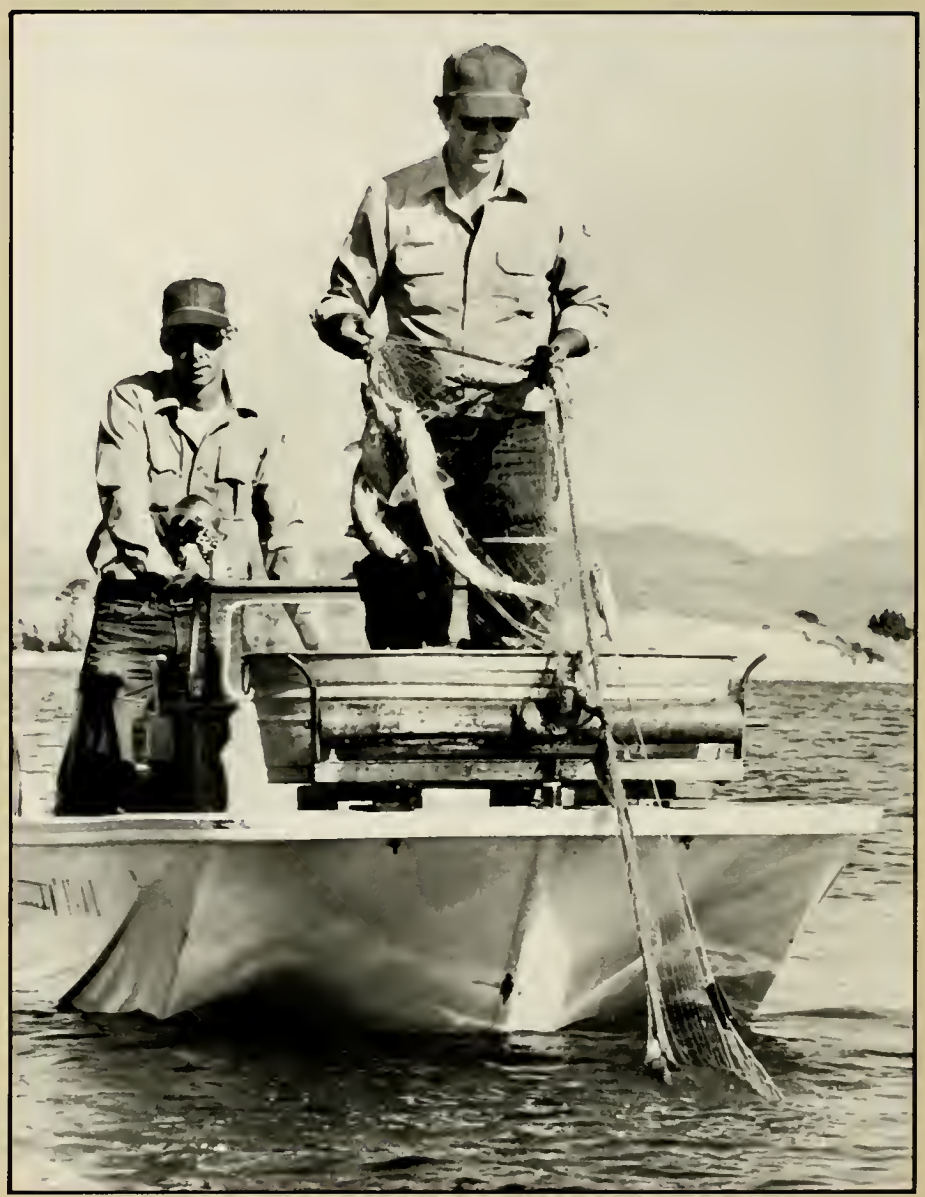
But perhaps the greatest problem at Canyon Ferry is the fragile nature of managing with a very short-lived fish. The Arlee strain management has been relatively successful for over a decade, but the present plight illustrates what can happen if plants fail.

The solution to a more stable Canyon Ferry fishery is to find a longer

lived rainbow and to eliminate the possibility that fish can escape from the reservoir.

In an attempt to "cover all bases," two strains of rainbows were stocked into Canyon Ferry Reservoir in 1983.

Bruce Rehwinkel pulls in a gill net from the bottom of Canyon Ferry Reservoir. Gill netting is the most effective means of sampling fish populations in large reservoirs.



GENE FISCHER

The first to go in were 200,000 of the Arlee strain. They were stocked before and during the spill from Canyon Ferry. An additional 200,000 Arlee rainbows were stocked after the spill, and biologists placed a clip on the left pelvic fin of 10% of them. In September, 240,000 wild DeSmet rainbows were stocked, and an adipose fin clip was placed on 10% of them. The department's goal of longevity rests with the DeSmet strain. Studies elsewhere have shown it lives between 7 and 10 years. Since it is of wild origin, it will run in the spring. Biologists are optimistic that its reproducing capabilities will enable the DeSmet rainbow to supplement the reservoir as well.

During fall 1983, electrofishing between Townsend and Canyon Ferry documented another rainbow run. For the most part, the run was similar to the poor one of 1982. However, since the autumn was mild, sampling continued much later than usual. The highest numbers of rainbows were present in mid- to late November. Biologists also sampled substantial numbers of the 1983 plant in the river—and numbers were comparable to some of the better years. While it is not clear why these young-of-the-year rainbows enter the Missouri River in the fall, they provide a clue to the survival rate of the reservoir plants. It appears that both Arlee and DeSmet plants were successful in 1983, and we believe the fishery will begin to rebound by late 1984 or '85.

The department will continue to devote a great deal of effort to improving the rainbow fishery in Canyon Ferry. If all goes as planned, fishermen can anticipate a return to the "good old days" within two or three years. ■

MIKE ADERHOLD

THE FISH WITH THE GLASSY EYE

by Ken Walcheck

Even though it was more than three decades ago, the memory still burns warmly.

The aroma of hot cakes, coffee, and fried walleye filets drifted through our tent.

"You awake?" asked my father.

"Yeah, sorta," I slowly answered. The pine mattress smelled wonderful, and the blankets were toasty. The fire slowly pushed its heat into the tent, and I felt as content as a fat tick.

"You been fishin' this morning?" I asked.

"Yup—and this is a glorious day for it," he added. "Smell them?" I grinned, as he gave me a playful kick in the ribs with his boot. Pausing only to light his pipe, he told me about the four-pound walleye he had just caught.

We were camped on the bank of the Wolf River in Wisconsin, a stream known for its excellent walleye fishing. It was our annual trek to fish for walleye during their spring spawning run. We hustled through breakfast, rigged our tackle, and walked down the road to our favorite fishing hole.

Rounding the bend in the road, Dad stopped and pointed to an old pickup parked by the side of the road. "Shoot," he barked, "they're fishing our favorite stretch of water. Maybe we can 'Tom Sawyer' them."

"You mean try to trick them into fishing another reach of river?" I asked.

"Worth a try, and nothin' to lose," he answered.

We walked down to the river where a man and his three young sons were fishing with long bamboo poles, using night crawlers as bait.

"How's the fishing?" we asked.

"Nothing yet," the man answered.

"It's really not good worming water," my father said.

"How come?" The man looked puzzled.

"Well, the current's too fast, and the holes aren't deep enough. Walleyes don't stack up here like they do in the larger holes farther upstream," Dad explained.

"That so? Where would you suggest we fish?"

"Well," he advised, "if I was worming, I'd try the big hole under the railroad trestle about a half-mile upstream." (This was true enough,

because we *had* caught fish there in past years.)

"Thanks for the tip. Appreciate it!" said the fisherman, who then called to his sons to take in their lines.

After they left, we grinned at each other, waded out into the river, and started casting our lead-headed jigs. We soon caught a fair stringer of walleyes, but nothing big. Most of the fish were in the 1½- to 2-pound class.

About an hour later, we heard a vehicle stop on the road. It was the old pickup.

"Hey mister!" the man yelled as he walked down to where we were fishing. "Sure would like to thank you for the good fishing tip." He turned to his boys and shouted, "Bring 'em on down." The two biggest boys staggered down to us, each holding the end of a stringer with a mess of lunker walleyes that made our eyes pop. The largest probably weighed more than 8 pounds.

"Yessir, we caught them just where you said they'd be. They were hitting those crawlers as fast as we could bait up." With a wink of the eye and a wave of the hand, he said, "Thanks again!" When I later thought about it, I think he was really telling us that the sly strategy of covetous anglers sometimes develops a boomerang twist.

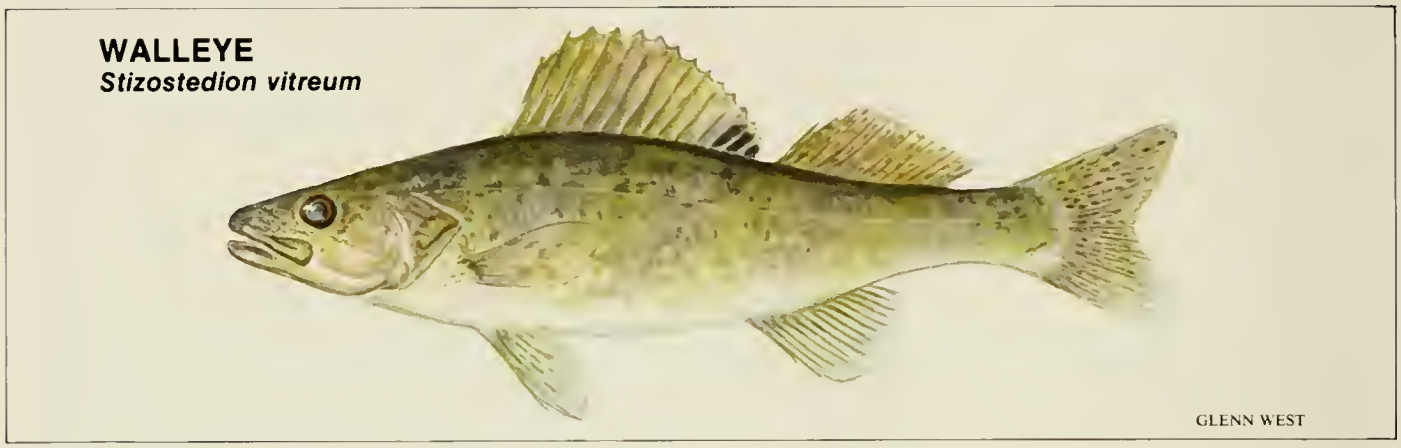
Nine times of 10, there are two things a walleye fisherman can count on: First, the fish won't be where he expects to find them; second, when he does locate them, he'll be lucky if they don't take off for some unknown destination within an hour.

Fisheries biologists label the walleye *Stizostedion* (pungent throat) *vitreum* (glassy—from the fish's large eye). It has more names than a first-class con artist. It's called pickerel, yellow pike, perch, marble-eye, wall-eyed pike, glasseye, dory, blue pike, and many other descriptive names. But the name "walleye" is more suitable and less confusing. It refers to the smoky, silvery eye, which is similar to that of blinded or "wall-eyed" domestic animals.

Because of its numerous needlelike teeth, the walleye is sometimes called a pike. This is a misnomer, since the walleye belongs to the perch (Percidae) family, not to the pike (Esocidae) family. The walleye is the largest member of its family, and in Montana its finned cousins include the sauger, Iowa darter, and yellow perch. The state record walleye was taken from Nelson Reservoir in Phillips County in 1974 by Neil Berg; the fish weighed 14 pounds.

Its range in North America originally included lakes and rivers throughout much of Canada; south through New Hampshire, New York, and Pennsylvania; along the west slope of the Appalachian Mountains to Alabama, and north and west through the eastern half of states from Oklahoma to North Dakota. Because of its popularity with sport and commercial fishermen, it has been widely introduced into waters outside its native range and is now found in practically every state.

In spite of what many Montana anglers insist, the walleye is not native to Montana. Although it has been around for more than half a century, there is no reliable information about the first introduction. The first plant recorded by the Department of Fish, Wildlife and Parks was in the Missouri River (Cascade County) in 1933. Although walleyes can be found in a sprinkling of western Montana lakes and reservoirs, their present distribution east of the Continental Divide is confined primarily to the Missouri and Yellowstone drainages.



LIFE HISTORY

Description. The walleye is spindle-shaped, about six times as long as it is deep, with a large mouth filled with sharp, tearing teeth. The two distinct dorsal fins (on the top of the fish's back) are well-separated, with the first one spiny and the second soft. If one were to stroke the fish from the back to the front, it would feel like a piece of rough sandpaper because of patches of spiny prickles on the exposed parts of the scales. The sharp bones on the gills can also cause painful cuts to careless handlers.

Color ranges from olive-yellow to dark brown, mottled with brassy yellow. The top of the lower lobe of the tail fin has a distinct creamy or white margin. If you look a bit more closely, you will note a dark blotch at the rear base of the first dorsal fin. Anglers often confuse the walleye and its first cousin, the sauger; however, the sauger has a polka-dot pattern of black spots on the entire dorsal fin. Crosses between the walleye and sauger (saugeye) cause characteristics to blend and make identification difficult.

Behavior and Habitat. The walleye's daily movements and feeding schedule are governed by its ability to see well in dim light. It can see well in dim light because of the way its eye is built. The retina has a layer, the

tapetum lucidum, which reflects and also collects available light. If one were to shine a spotlight into a walleye's eyes at night, they would glow, much like the eyes of a cat. The tapetum also makes the walleye's eyes sensitive to bright light, which is why it feeds at twilight or during other periods of dim light.

Walleyes thrive in a variety of Montana waters and tolerate a wide range of environmental conditions. They prefer large, shallow, well-oxygenated, turbid lakes and reservoirs which provide the necessary spawning grounds as well as forage fish for food. Typical walleye waters include Fort Peck, Nelson, and the Tongue River reservoirs. Large rivers, such as the Missouri and Yellowstone, deep or turbid enough to provide shelter in daylight, also provide suitable habitat.

Movements include a spring spawning run to shallow shoals or tributary rivers, daily movements up and down in response to light intensity, and daily or seasonal movements in response to temperature or food availability.

Spawning. Walleye spawning areas vary—from a gravel or cobble-covered shoal in a lake where the water is one to five feet deep, to riffles in a tributary stream, to a rock and gravel bar along a river. The necessities are a coarse gravel to cobble bottom, shallow water, and current or wave action to keep the eggs free from sediment.

Spawning occurs from mid-April to May 1, when water temperature ranges from 44° to 50° F. Males are the first to seek the spawning grounds, and they stay around for a short time after the females have spawned and left. Spawning takes place at night, usually in groups of one larger female and one or two smaller females and up to six males. Male walleyes mature sexually at two to four years, and females at three to five years.

Prespawning activities include pursuit, shoving, circular swimming, and fin erection. Once on the spawning site, a male and female sidle up to each other. With a slight tilt, vents are brought close together, and eggs and milt (sperm) are extruded. The fertilized eggs drift down and fall into crevices between boulders and coarse gravel of lake shoals and bars, or onto the gravelly bottoms of streams.

Mature females are quite prolific. Depending on size and age, a single female produces about 85,000 eggs per year—or about 35,000 per pound. Large numbers of eggs are produced because of the parents' lack of concern for the eggs and newly hatched offspring. At usual spring water temperatures, walleye eggs hatch in 12 to 18 days; if water temperature rises, the eggs hatch sooner.

There is some evidence that walleyes "home" to specific spawning areas, a pattern reinforced with each return to a specific spawning ground. In 1976, department personnel located a major walleye spawning ground on the lower Yellowstone River immediately downstream from Intake Dam. Tag returns from anglers and results from electrofishing surveys revealed that almost all walleye tagged in the Yellowstone during early spring return later that spring to Sakakawea Reservoir in North Dakota—an average of 140 river miles each way—on their migration to and from the Yellowstone River.

Walleye Survival and Food. As the walleye passes from egg to fry (newly hatched fish) to fingerling (young fish, a stage between fry and adult), it is exposed to a wide variety of environmental hazards. A successful hatch represents only the first hurdle. After that, death lurks in many corners. It could be in the form of starvation due to abnormally cool weather and failure of the hatch to coincide with abundant food production, or it could pounce suddenly in the form of the bigger jaws of a larger brother, sister, or other predatory fish. Or, it could creep in slowly from infection or other disease.

Newly hatched fry feed on zooplankton, microscopic aquatic animals as small or smaller than the period ending this sentence. When the young walleyes reach 1½ to 2 inches long, they begin to feed more heavily on insect larvae and small forage fish such as newly hatched yellow perch. Larger fingerlings and subadult walleyes require an abundance of forage fish. It seems safe to say walleyes utilize any species of fish available to them. Although adults are mainly fish eaters, they eat large aquatic insects and other invertebrates when they are available.

WALLEYE MANAGEMENT IN MONTANA

In recent years, fishing for walleyes in eastern Montana has become an important sport fisheries drawing card. Because of the increased interest, Walleyes Unlimited (WU) was organized in February 1983. The group's goals include organizing and educating fishermen to promote walleyes and warm water fishing; developing a forage fish program for walleyes, and establishing a permanent warm water fish hatchery to supply stock for suitable eastern Montana lakes and reservoirs. The group also plans to construct and install man-made spawning reefs to enhance natural reproduction.

Since it began, several thousand eastern Montana fishermen have rallied behind the warm water fishery—and along with it, the hope of attracting a group comparable to the trout fishermen in the western part of the state. After reading and hearing the glowing reports of walleye success in Missouri River reservoirs in the Dakotas such as Sakakawea and Oahe, WU members would like to work toward a similar success story at Fort Peck Reservoir.

The DFWP has records of more than 59 million walleye fry and fingerlings planted through 1983, in 110 reservoirs, lakes, and streams. Fort Peck Reservoir has received the largest share—about 7 million—of the stocked fish. The department's program has emphasized introducing them where suitable habitat and forage fish are available, with the hope they would reproduce and eventually contribute to the fishery.

Many sportsmen wonder why the department doesn't expand angling opportunities by planting walleyes into western Montana lakes. Although fisheries biologists delight in seeing happy and contented anglers, they also must make hard, realistic biological decisions to preserve quality. Introductions are tricky, and caution is always imperative—what may seem to be a desirable introduction may turn out to be a monstrous problem with side effects that weren't foreseen. Some introductions of ex-

otic species into the state's western waters—the northern pike, for example—have resulted in those species setting up permanent residency at the expense of native trout species. The highly regarded trout fishery is unique to western Montana and current management efforts are directed toward protecting, maintaining, and enhancing trout habitat wherever feasible.

To enhance its eastern Montana walleye fishery, the department is "beefing up" its management program, including propagation, stocking, and forage fish introductions. Let's take a look at each of the programs:

Artificial Propagation and Stocking. Before 1983, the department never had a warm water fish hatchery of its own (other than McNeil Slough, an early-day warm water hatchery). The department has depended on outside sources for walleye eggs, fry, and fingerlings. As a result, supplies have been variable—a feast and famine situation. On April 1, 1983, the department took over the Federal National Fish Hatchery in Miles City. With the change in management, efforts of the warm water fisheries program were directed toward gathering walleye eggs below Intake Dam on the lower Yellowstone. The eggs will be hatched and reared at the Miles City Hatchery and later stocked in Fort Peck and other suitable reservoirs. Chances for fertilized eggs to reach fry size in a river such as the Yellowstone are slim; only one in 20 make it. However, success rate in a hatchery—where water flow and temperature can be carefully regulated and where predators are absent—soars to over 70%.

During spring of 1983, approximately 500,000 eggs were harvested from the lower Yellowstone River by department personnel. Surviving fry were raised to the fingerling stage at the Miles City Hatchery and planted in the upper end of Fort Peck Reservoir. Biologists hope that some factor in the genetic makeup of the Yellowstone walleye will signal the planted fish to run up the Missouri River when they are old enough to spawn. In the future, biologists plan to expand egg collections on the Yellowstone.

In addition, nearly 5 million eggs were obtained during spring 1983 from North and South Dakota and hatched in the Miles City Hatchery. These fry were planted at selected sites in the Big Dry Arm and lower portions of Fort Peck Reservoir to bolster walleye numbers.

Forage Fish Introductions. A second phase of the management program involves increasing the forage fish food base for walleyes in Fort Peck. Without adequate forage, reproductive capability of walleyes is reduced; also, walleye young of the year are eaten by existing adult populations of predatory fish. This kind of vicious cycle not only limits the number of fish available to the angler, but also impairs the effectiveness of stocking as a tool for maintaining game fish populations.

Populations of yellow perch, the primary food fish for walleyes in Fort Peck Reservoir, have declined because spawning habitat has decreased. Also, the amount of silt deposited on the reservoir's bottom has increased. After deliberating about a forage fish for Fort Peck, biologists decided to try the plankton-feeding cisco, *Coregonus artedii*, a member of the whitefish family. A total of 3 million cisco eggs from Minnesota were transported to the Miles City Hatchery and to the Fort Peck Powerhouse (which was made available through cooperation of the Corps of Engineers). From 8 to 10 million cisco eggs have also been obtained from Canada.

Rainbow smelt, the forage fish which played a key role in Sakakawea's walleye success story, was bypassed because of fear the predatory species could gain access to

Walleyes can be caught under a variety of conditions—in rivers, lakes, or reservoirs, at any time of year, and at any time of day or night. This fisherman is trying his luck through the ice at Nelson Reservoir in northeastern Montana. Part of the scientific name of the walleye is a word meaning "glassy," which no doubt stems from the fish's large silvery eye. Because of the way its eye is built, it can see well in dim light.

MIKE ADERHOLD

the Musselshell, Judith, Teton, and Marias river systems and cause problems with trout. Concern was also expressed that unauthorized introductions of smelt could cause serious problems if the smelt were transported above mainstem dams on the Missouri and into the better trout waters; others were concerned about later effects on the Missouri River paddlefish fishery.

Limited numbers (3,000) of spottail shiners, a non-predatory forage species, were planted in the Big Dry Arm of Fort Peck during spring 1982. In 1983, an additional 185,000 spottails, obtained from Minnesota, were planted in the reservoir. Shoreline seining in fall showed successful spawning had occurred.

The real key to how much the Fort Peck walleye fishery can be improved depends on availability of spawning habitat. While many fishermen believe that stocking is the answer to better walleye fishing, department fisheries biologists stress that natural reproduction is the key to a good walleye fishery, particularly in a huge reservoir like Fort Peck. Stocked walleye fry are a poor substitute for the millions that can be produced, under the right conditions, by a wild population.

Some people believe that Fort Peck will never match Sakakawea because of the differences in availability of spawning habitat. "We don't think Fort Peck will ever be as good as Sakakawea," said Dick Johnson, the department's deputy director and former supervisor for the Glasgow region. "It's just a fact of nature that Fort Peck doesn't have the spawning grounds Sakakawea has." Geological evidence substantiates Johnson's statement.

From 10,000 to 13,000 years ago, the bands of hunters who were the ancestors of modern man witnessed the end of an important chapter of the earth's history. The great sheets of ice that had covered about one-third of the earth were melting, exposing land that had lain under thick, icy layers for thousands of years. In Montana, the ice sheet (the Wisconsin) pushed into the northern tier of counties, from Toole County eastward, but it never reached as far south as the area of present-day Fort Peck Reservoir. As a result, no glacial drift (a general term for debris deposited by a glacier) was laid down in the Fort Peck area. In contrast, North Dakota (except the southwestern part of the state) received widespread deposits of drift—which became ideal spawning habitat for the walleyes that were to come later.

The Illinoian ice sheet, the only other continental ice sheet which reached Montana, preceded the Wisconsin glaciation. It reached as far south as the present-day Missouri River. But centuries of weathering decomposed and disintegrated much of the Missouri's granite gravels and boulders to finer particles not suitable for walleye habitat.

Another part of the glaciation story centers on the large silt-laden glacial lakes formed from the melt waters of the retreating glaciers. Today, streams and rivers flowing north into Fort Peck Reservoir, such as the Musselshell, cut through sediment-filled glacial Lake Musselshell and others, depositing even more silt and other sediments. But these streams add nothing to the reservoir in terms of gravels and cobbles.

Fluctuating water levels in the reservoir also deter spawning walleyes. During low water years, gravel beaches are left dry during the spring spawning season.

Montana's walleye management program is long-range. There are no short-term magic tricks that can guarantee instant success. In the face of steadily increasing numbers of anglers, the department is determined to improve its programs and to establish an enviable record for walleye fishermen of the future.

FISHING FOR THE FISH WITH THE GLASSY EYE

If heaven were a good walleye spot, I know of about 1,001 Montana anglers who would die to get there. Adored by gourmets for its superb table qualities and by sport fishermen for its crafty ways and stubborn bottom fighting when hooked, the walleye angler who hears "Come a'runnin! The walleyes are biting!" is going to take immediate action.

But even among dedicated walleye fishermen, only a small percentage are consistently successful. Although walleyes are sometimes taken by bass, pike, and even trout fishermen, most of the techniques used on these other species will not always take walleyes.

Walleyes can be caught under a variety of conditions—in rivers and lakes, at any time of the year, and at any time of day or night. As a result, no *one* technique is going to consistently put these fish into the cooler. A variety of techniques is the answer.

Montana is blessed with a number of "walleye hounds." As an avid fisherman myself, I've been privileged to gather tips from some of these folks. Four expert walleye fishermen and their hints follow. Their techniques differ, but each has a system that has been successful in bagging the fish with the glassy eye.

* * * * *

Mary Gjersing of Havre has been an avid walleye fisherman for a number of years. Every summer, she and her late husband Frank traveled to the northern reaches of Saskatchewan to troll their favorite waters:

"The walleye is possibly the most unpredictable of all the fresh-water fish. In all my years of fishing, these creatures have baffled me more times than I care to admit. But the thrill of outsmarting Mr. Walleye and the taste of the golden-brown filets keep me going back for more.

"There are several reasons why I regularly catch walleyes. The most important is patience. Next in order is probably the light tackle I use. Light tackle gives me a better feeling of what is going on than heavy tackle can. For me, trolling in 10 to 15 feet of water parallel to a rocky shore is the most productive way to catch walleyes. When an angler asks me how he should troll, I always tell him to troll as slowly as he thinks the right speed might be—and then cut it in half. More than once, I've seen one boat troll through a school of fish, hooking at least one on each pass through the school. Another boat, with fishermen using the same lures, couldn't get a hit—probably because it was going too fast.

"I make most of my good catches with a Mister Twister or Beetle lure spinner rig. There's just one place to catch a walleye and that's on the bottom. Surprisingly, many anglers forget to follow this rule. When I

hook a fish, I try to mark the site with a shore tree or boulder and use that marker when making a return run. Dropping a location buoy over the side at a hot spot can be helpful if there's no way to line up the hole. Walleyes travel in schools, so finding one can mean filling a stringer in a hurry.

"Early June is my favorite month for fishing. Walleye schools have broken into subgroups. Because the lake's food chain is just starting to develop, the walleyes' food supply is still not at its peak. This means super fishing."

* * * * *

Larry Torstenbo, Miles City, spends a good share of his summer free time pursuing walleyes in the vast reaches of Fort Peck Reservoir. Jigging is his favorite method for catching walleyes:

"There are several things to consider when you fish for walleyes—the bait, the weather, the time of day, and the water temperature. Successful fishing is more than just luck. Understanding underwater geography is the name of the game for walleyes. When I'm after walleyes, I don't fish just anywhere. I focus on structure—submerged islands, rocky points, drop-offs, and steep breaks on the bottom are all areas where fish congregate. You won't catch fish consistently unless you find the right structure. I like to use a depth finder. This valuable device takes much of the guesswork out of determining underwater geography.

"I prefer jig fishing because the jig is probably the most potent of all walleye lures. It's also one of the most versatile. Jigs can be used throughout the year in lakes, rivers, and reservoirs. Some say jigging is jigging—and this is true up to a point. But technique is what produces fish. A very good lure for walleyes is a 1/8- or 1/4-ounce jig. I've experimented with white, yellow, and black marabou jigs and, according to my 'Fisherman's Log,' yellow was about a 3-to-1 favorite.

"There are many methods and tricks to fishing the jigs properly, but one thing remains constant: The jig must be fished on or very close to the bottom, or just along the edge of

Fort Peck Reservoir (photo: MIKE ADERHOLD)

WHERE TO CATCH 'EM

Montana's Walleye and Sauger Waters

Central and North Central Montana

Fresno Reservoir (walleye)—near Havre
Hauser and Holter reservoirs; Lake Helena (sparse walleye populations)—near Helena
Marias River (sauger and some walleye)—below Tiber Dam
Milk River (sauger and walleye)—below Fresno Dam
Missouri River (sauger and walleye)—Morony Dam to Fort Peck Reservoir
Tiber Reservoir (sauger and walleye)—near Chester

Northeastern Montana

Fort Peck Reservoir (sauger and walleye)—near town of Fort Peck
Missouri River (sauger and walleye)—below Fort Peck Dam
Nelson Reservoir (walleye)—near Malta
Poplar River (walleye and sauger)—near Scobey
Milk River (walleye)—from Fresno Dam to the mouth
Several small reservoirs in northeastern Montana have walleye.

Southeastern Montana

Bighorn River (sauger and walleye)—Yellowtail Dam to mouth
Tongue River (sauger and walleye)—Tongue River Dam to mouth
Tongue River Reservoir (walleye and sauger)—near Decker
Yellowtail Reservoir and afterbay (walleye)—near St. Xavier
Yellowstone River (sauger and walleye)—between Billings and North Dakota border
Several small reservoirs in southeastern Montana have walleye.

weed beds or brushy shelters. At times, the fish prefer the lure inched along the bottom, stirring up small spurts of sand or silt; at other times, longer and faster hops of one to three feet produce the best results. A 1/4-ounce jig produces good action on hard sand, rock, or gravel bottoms, while a 1/8-ounce jig gives the angler better control when he's fishing over weed beds and enables him to give the lure more enticing action.

"When I'm jigging, watching the line and keeping the slack out is the real secret. Many jig fishermen can't master this tight-line technique. The best way I know to explain tight-line jigging is to say that it should be done very slowly. Unlike a spinner or spoon, a jig has no action on a steady retrieve. When the jig sinks to the bottom, reel in the slack. As you raise the rod tip about 10 inches in one smooth motion, *don't* reel in the slack. The instant the jig starts to flutter down toward the bottom, reel in the slack. When the rod starts down, you must reel in the slack fast enough to match the speed of the descent. By doing this, you always have a tight and sensitive line that can tip you off to a walleye's gentle take."

* * * * *

Mitch Howe, president of the Rosebud-Treasure Wildlife Association and a resident of Forsyth, is a lower Yellowstone angler who has long appreciated the many recreational attributes of the free-flowing Yellowstone, especially its walleye fishery:

"Big rivers grow big walleyes. The reason is simple: Not many of them get caught. Walleyes are moody, elusive, and unpredictable—regardless of where they live. Big rivers such as the Yellowstone can add even more frustrations for the angler, such as fluctuating water levels and turbidity. But even though catching big-river walleyes can be tough, the rewards make it well worth the effort.

"Many fishermen don't fully understand the walleye spawning cycle and how they behave at different stages of the cycle. Walleyes bite readily in the prespawning period, and a walleye bonanza can materialize when fish start to stack up into a small area such as the tailwaters of a dam or the area below a diversion dam such as Huntley, Waco, Forsyth, or Intake. The time of the prespawning period varies, depending on water temperature and day length (which controls their 'biological clock'). The middle and latter part of April usually produce the best fishing for me.

"Trying to get a walleye to bite during the spawning period—which can extend up to two weeks—is another story. It's like trying to lure a lover of finely prepared cuisine out of a fancy restaurant with a hot dog—just about next to impossible. After spawning, males are the first fish to start feeding. It generally takes about 10 days before the females start feeding.

"I concentrate my fishing efforts during the prespawning run. When the water warms to about 50° F, the walleye's personality changes. It loses some of its lethargy and becomes more aggressive in its feeding habits. When they're on a feeding binge, they'll wolf down almost anything in sight. My first preference is a 1/4-ounce Mister Twister lure without a spinner. If I had to choose a second lure, it would be a Rapala, either in gold and black or silver and black.

"I consistently outfish other walleye anglers because I am impatient. I seldom fish a jig of one color or use one style of retrieve for more than five minutes. Sometimes walleyes want a slow retrieve. If that doesn't work, I try a fast retrieve. If that doesn't work, I try a varied retrieve. If none of those work, then I change lures."

* * * * *

Howard Letke, Miles City, is another avid walleye and sauger fisherman. He probably knows the good fishing holes on the Tongue River better than anyone. As his number one choice, he chooses live bait:

"After fishing for walleyes for a good many years, I've found that the attractiveness of live bait to walleyes is unequaled. For the best walleye fishing, you can't beat live motion. This principle especially holds for the lunkers. These heavyweights are careful about what they go after and they seem to like bait such as a minnow, night crawler, or a leech moving *slowly* along the bottom.

"I prefer to use the Lindy slip-sinker rig when fishing live bait. The outfit includes a shoe-shaped slip sinker which is virtually unsnaggable. Tied below the sinker is a swivel clip, to which you snap on a two-foot leader and a No. 8 snelled, shankless hook. Hooked through the lips of a minnow or buried in the head of a night crawler, the small hook is almost invisible. Six-pound test leader further disguises the rig.

"Since a slip sinker is used, the weight has no effect on action of the bait, and the walleye doesn't feel the sinker once he tries to run with it. When fishing night crawlers, it's important to hook them once through the head, so the crawler trails the hook like a small garter snake. A 'gob' of night crawlers is fine for catfish, but walleye won't give such bait a second look. I never cut corners when using live bait. If you're using night crawlers, use the biggest, liveliest ones you can find. Minnows should be scrappy and strong, not on their last 'fins.' When you consider the expense of your other equipment, live bait—the most important element in attracting a fish—is no place to skimp.

"I like to wade out to the middle of a river and cast my bait slightly upstream and toward each shoreline. I reel in just fast enough to give the line action, and the current swings the bait in a wide arc, taking it downstream through a deep hole.

"For the fussy walleyes who aren't really on a feeding binge and grab only a minnow's tail, a sure bet is to attach a 'stinger.' To make a stinger, tie a small treble hook to the bend of your hook, using a short piece of eight-pound-test monofilament. Then push the hook through the minnow's lips and impale one prong of the treble hook into its tail."

* * * * *

You've got some pretty good hints from the experts. Give walleyes a try. They're baffling, thrilling, smart, moody, unpredictable, elusive—but they're also a sporty way to add good taste to your dinner table. ■

SENTINEL

story and photos by Mike Logan

I could almost see him there beside his monument.

He piled the stones. Big squared-off slabs, one on the other, 'til finally he had to make a rock platform to stand on while he muscled the last ones into place well above his head.

We saw it first, old Smoke and I, when he was a soft-mouthed pup. I shot a Hungarian partridge at the foot of the barren browning hill in the range of barren browning hills.

Tenderfooting through the prickly pear, Smoke gently laid the grey-rust bundle in my hand. I was proud of him that day. There was no frost on the midnight muzzle then, and the old cock pheasant had yet to sink in the spurs that would later make him hardmouth everything but ducks.

I scratched behind his puppy ears and promised someday we'd climb up there and just sit a while.

We didn't know it was a sheepherder's monument then.

Years later we finally sat on the flat stone step and felt the ghosts of that other man and of his dogs.

I pictured him clean-shaven. The man who laid those stones so squarely would be neat.

He thought ahead. There was a small ledge. Just right for the binoculars he used to watch for coyotes as his band of sheep close-cropped the sere, tan grass.

A rifle with a battered stock and worn spots showing whitish through once-blued steel would lean beside him. Likely an aging '06 Springfield or a Krag with a weathered leather sling. The bore, though, would be immaculate and the smoothness of the action something to be felt.

I think my ghost smoked a pipe and liked his own company, though he probably felt a now-and-then twinge of loneliness.

He liked dogs, too, but didn't pamper his. They were working dogs; crossbred mixtures who knew what to do and when.

Smoke seemed to sense them as he dozed beside me in the sun. He liked the place.

We've been back since and always leave, as we did that day, happy to have shared the view and a quiet time with a well-remembered friend.

Other Huns have fallen at the foot of the hill, but most of all I like looking back to see his monument, at last light, silhouetted on the misty pinks and purples.

I always know he's there—a solitary sentinel, watching by the high stone cairn. ■

Black bears *continued*

the causes of bear damage problems, of the impacts of land uses on bear habitat, and of precautions to take during human activities in bear country.

5. Developing "trend areas," as with deer and elk, where population fluctuations can be periodically monitored by aerial surveys, capture/recapture information, and harvest data.

6. Surveying bear hunters, using a specific questionnaire designed to evaluate hunter satisfaction, success, and areas of hunting concern.

7. Testing trend-estimating techniques used successfully in other states: visits by bears to scent stations, using refined hunter kill information to evaluate the balance between births and deaths, etc.

8. Exploring the relationship between hunting pressure, harvest levels, and depredation problems, and regulating road access.

9. Determining the cause, extent, and frequency of nuisance and damage actions. Determining the number of bears moved and killed by agencies and property owners. Weighing costs and benefits to see if a more reasonable way exists to handle this problem.

10. Better coordinating research and management activities with land management groups supporting the black bear.

11. Requiring hunters to salvage edible meat and encouraging hunters to utilize the bear's hide.

12. Making a special effort to document the poaching problem.

The Department of Fish, Wildlife and Parks welcomes public review of these suggestions, and is open to others. Specific comments should be addressed to members of the department's Black Bear Committee:

- Region 1: Jerry Brown, Route 2, Box 438; Libby, MT 59923.
- Region 2: Bob Henderson, 3201 Spurgin Rd.; Missoula, MT 59801.
- Region 3: Jon Swenson, 1001 Ridgeway Dr.; Livingston, MT 59047.
- Region 4: Dick Bucsis, Box 385; White Sulphur Springs, MT 59645.
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KNOW YOUR BEARS

MIKE ADERHOLD

Between 1975 and 1983, the Department of Fish, Wildlife and Parks documented nine grizzly bears killed because they were mistaken for black bears. During the same time period, three grizzlies were killed by mistake in Wyoming and two in British Columbia. All 14 mistakes could have—and *should* have—been avoided, not because grizzlies and black bears are so easy to tell apart (they are *not* in some cases), but because the #1 hunting rule is: *DO NOT SHOOT UNTIL YOU ARE* SURE *OF YOUR TARGET.*

The limited grizzly bear hunt in Montana is not only based on the principle of biological surplus, but also on the political reality that to survive, the great bear needs all possible support. The fact that the grizzly is a game animal and there is a limited season brings to its cause many who might not otherwise be there. A second reason for the hunt is that evidence suggests a hunted population is less likely to associate with man or become used to man's food and living areas. The worst situation for the threatened grizzly is an encounter where someone is hurt. Such incidents cancel positive feelings involving the animal, and erode the endorsement that the bear now enjoys. Mistaken grizzly kills threaten this hunt, as well as the spring black bear season.

No single description fits all grizzlies or all black bears. Like people, every single one is different. However, the following characteristics can be used to distinguish between the two species: coat color, overall profile, shape of the head, line of the back, and

claw length. These characteristics must be viewed *in combination.* Sometimes one or more traits may not be well developed or well expressed because of the animal's age, condition, or genetic makeup. For example, grizzlies vary in color from reddish-yellow to black, but tips of the long guard hairs are lightly pigmented, giving a yellowish or greyish cast to the grizzly. This coloring varies in intensity and extent, but in Montana, the grizzled coat is present to some degree in over 80% of the grizzlies (see photo). Most black bears are almost completely black, but they range in color from black to cinnamon. In western Montana, 60% to 70% of the black bears are black, with the remainder some shade of brown. When questioned, most observers have commented that the "frosted fur" is the first sign that alerts them to the fact that an animal may be a grizzly and not a black bear.

GRIZZLY BEAR

BLACK BEAR

In bears of about the same size, the grizzly's head appears larger and squarer than the black bear's. This is due to three features common to most grizzlies: (1) the cheek muscle which attaches to and operates the jaw is very well developed and has a greater mass than the same muscle in the black bear; (2) the frontal bone in the grizzly's skull, which extends from the crown to where the nose cartilage begins, is somewhat concave, giving the face a slightly "dished-in" look. The same bone in the black bear is flattened and forms a straight line to the nose; (3) many mature grizzlies have a ruff of long fur at the base of their skulls which gives the face a rounded look and makes the ears and neck look shorter. In most black bears, the facial ruff is not as common, and the face has a smoother, more funnel-like shape; the ears and snout appear longer and more pointed.

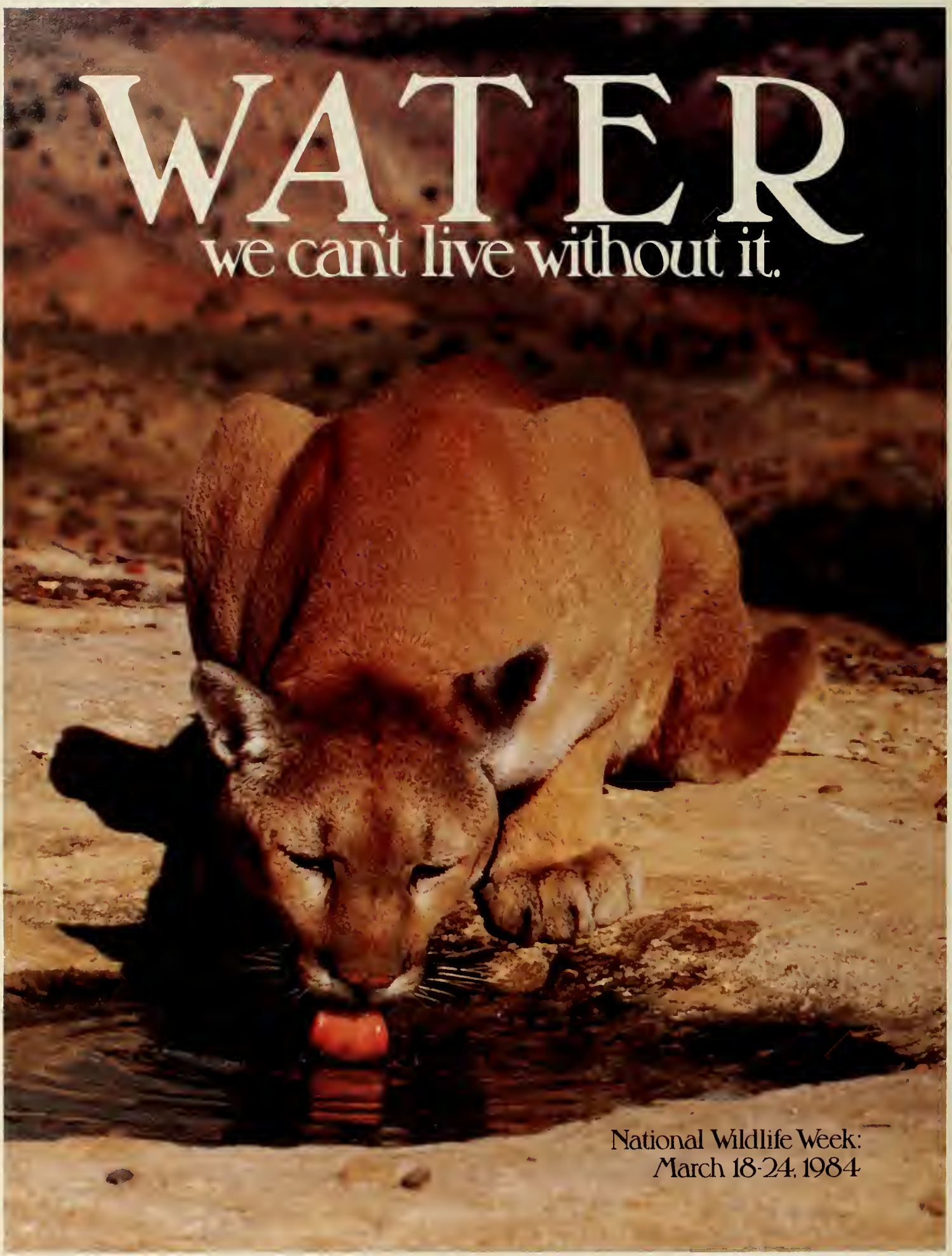
The shoulders of most grizzlies are larger and more muscled than those of black bears. This larger muscle mass gives the grizzly a hump above its front quarters. While black bears may also have well-developed shoulder muscles, they usually lack the forward bulge in the line of the back.

Standing on all four feet, grizzlies seem taller at the shoulders than at the hips. They look thicker at the base of the skull and in general huskier than a black bear. In the same position, black bears have a smoother profile and a rangier look. They appear higher at the hips than at the shoulders, and the ears and nose are more prominent.

The front claws of an adult grizzly are as long as a man's fingers, and sometimes longer (from 2½ to 5 inches). The front claws of a black bear are usually less than 1¾ inches long and are more curved, like a cat's. The claws on the back legs of both species are smaller, and in the case of a grizzly, are sometimes half as long as the front claws.

Another aid in identification uses footprints and has been developed by Dan Palmisciano, a biologist at the Department of Fish, Wildlife and Parks Research Laboratory in Bozeman. His technique involves running a straight line under one outside toe, with the line touching the front of the pad, and seeing where it hits the opposite toe. If the line hits above center, the footprint belongs to a black bear. If it hits the lower half of the outer toe, the footprint belongs to a grizzly bear. Black bear toes are in much more of an arc than the grizzly's which run in an almost straight line.

Weather, light, background color, distance from the animal, experience, level of excitement—all influence one's observations. Experienced bear hunters and biologists agree that there can be overlap in the appearance of grizzly and black bears, and much variability within individuals of each species. Generally, the characteristics described here are most easily seen in mature animals (4½ years old). A few bears—perhaps 5% or less—are difficult even for experts to identify, and even at close range. If you are hunting and you see such an animal, simply let it move on.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